



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

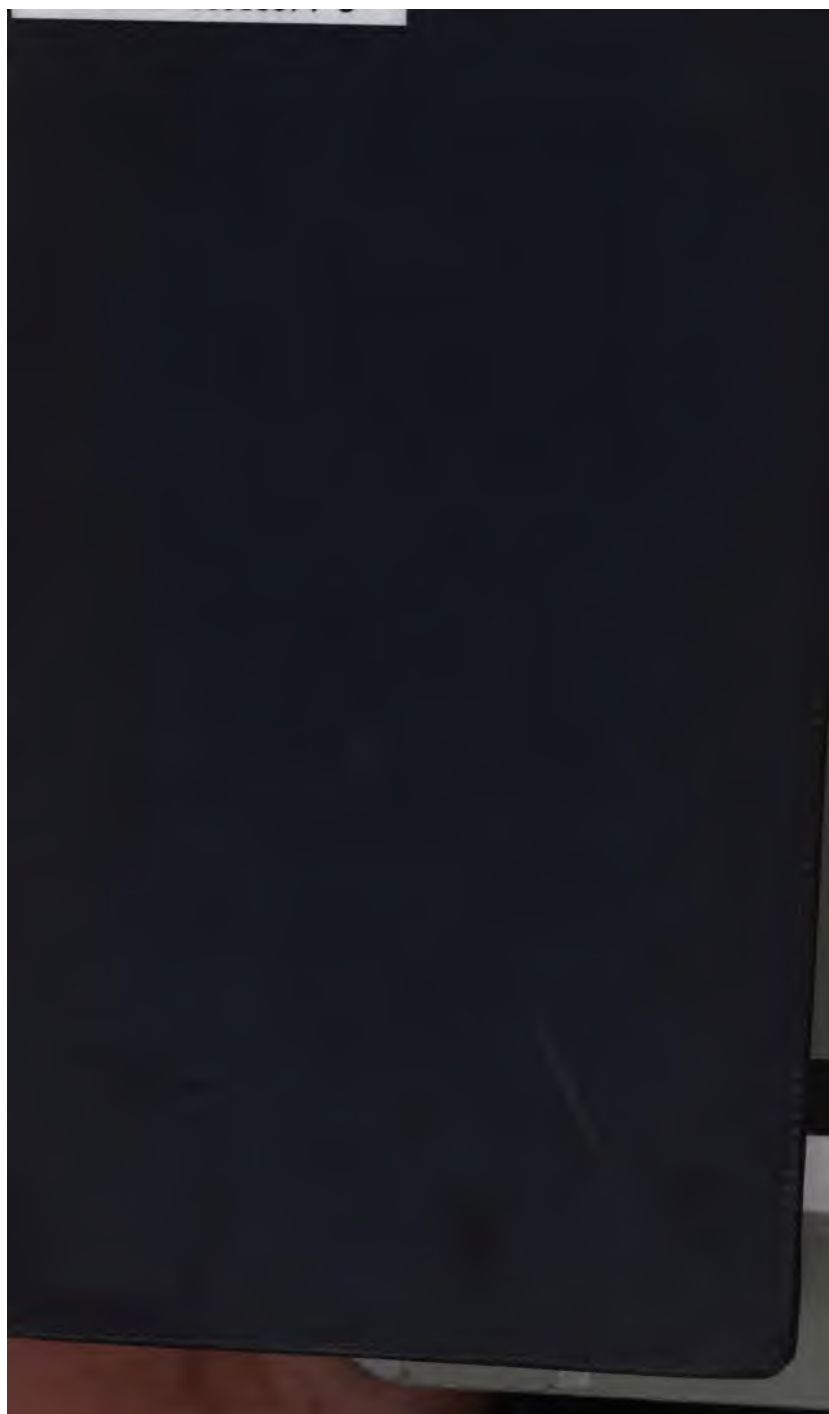
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>





Friedrich



1ST EDITION.

PRICE 50 CENTS.

THE
ACROCOSM AND MICROCOSM;

OR, THE
UNIVERSE WITHOUT AND THE UNIVERSE WITHIN:

BEING
AN UNFOLDING OF THE PLAN OF CREATION AND THE CORRESPOND-
ENCE OF TRUTHS, BOTH IN

THE WORLD OF SENSE AND THE WORLD OF SOUL.

In Two Parts.

BY WILLIAM FISHBOUGH.

PART I.
THE MACROCOSM; OR, THE UNIVERSE WITHOUT.

*Nature is a harp of SEVEN TIMES SEVEN strings,
On which, by God's own hand, is gently played
The ever-varied music of the spheres*

NEW YORK:
OWLERS AND WELLS, PUBLISHERS,
CLINTON HALL, 131 NASSAU STREET.

[London, 148 Washington st.]

[London, No. 142 Strand.]



THE
MACROCOSM AND MICROCOSM;

OR, THE
UNIVERSE WITHOUT AND THE UNIVERSE WITHIN: 1

BEING
AN UNFOLDING OF THE PLAN OF CREATION AND THE CORRESPOND-
ENCE OF TRUTHS, BOTH IN

THE WORLD OF SENSE AND THE WORLD OF SOUL.

In Two Parts.

BY WILLIAM FISHBOUGH.

PART I.
THE MACROCOSM; OR, THE UNIVERSE WITHOUT.

Nature is a harp of seven thousand silver strings,
On which, by God's own hand, is gently played
The ever-varied music of the spheres.

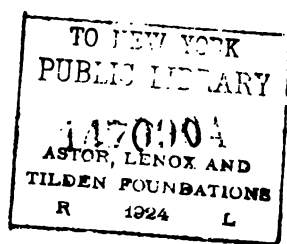
NEW YORK:
FOWLERS AND WELLS, PUBLISHERS,
CLINTON HALL, 181 NASSAU STREET.

Boston 143 Washington-st.]

1852.

[London, No. 143 Strand.

M.S.M.



Entered, according to Act of Congress, in the year 1852, by
WILLIAM FISHBOUGH,
 in the Clerk's Office of the District Court of the United States for the Southern District
 of New York.

N. Y. STEREOTYPE ASSOCIATION,
 201 William Street, N. Y.

P R E F A C E .

IN submitting the accompanying Treatise to the public, it may be proper to precede it by a few facts and remarks relative to its origin, plan, and purpose. In the summer of 1849, on retiring from the editorial charge of a Philosophical Journal, the writer announced his intention to prepare and publish, as soon as convenient, a work on Psychology—a subject then, as now, exciting much interest among a class of readers with whom he had been holding weekly communion. A manuscript of such a work was, during the few ensuing months, nearly finished; but various circumstances and considerations arose to prevent its publication, among the chief of which were, first, that with the materials of psychological science then unfolded, I found it impossible to bring the work to a desired state of perfection; and, secondly, that facts and principles such I was then able, only, to set forth, were already rapidly forcing themselves into general notice in another way. I concluded, therefore, to await the unfolding of further light upon a subject of which, at that time, no one could claim more than a very superficial knowledge, and to postpone the publication of the results of my investigations until they were further matured, and until the state of the public mind, upon questions to which they related, gave a fair indication that some particular use, not accomplished by other developments, might be possibly subserved in submitting them to general perusal. These statements involve an explanation and apology to a large portion of my former readers, who, as I learn, felt disappointed at the non-appearance of the announced publication at the time it was expected, and whose letters of inquiry respecting it I have, in some instances, been reluctantly compelled to leave unanswered.

As investigations have been continued upon the great subject of Psychology, together with its cognate and still higher themes, it has, of course, greatly expanded; until, in the aspect which the question finally assumed, it was perceived to be impossible to give any adequate exposition of the great realm of being *within* man, without the

aid of some more enlarged, systematic, and *interior* exposition than any which was yet generally extant, of the great realm of being *without*, which serves to the former as a natural counterpart and exponent.

Feeling, therefore, an embarrassment at the thought of writing upon the interior constitution, laws, and susceptibilities of man, without the comprehensive basis of a general material philosophy so universally harmonized and compacted, as to bring nature without into the obvious analogy of a single human being, and thus into an aspect in which it might be constantly drawn upon for comparisons and illustrations, I accordingly determined to precede my proposed anthropological Treatise by a general disquisition upon the realm of exterior being, which I have called the "MACROCOSM," in contradistinction to the human physical and psychical constitution, which I have called the "MICROCOSM." Both Treatises were, at first, designed to be submitted in one volume; but as it was perceived that each would embrace a subject which is complete in itself, though intimately connected with the other, it was finally determined to issue them separately.

In speaking briefly of the further objects and general plan of the present work, I will premise that the whole realm of created being, natural, psychological, and even spiritual, forms (at least in the general sense) one perfectly united System, consistent and harmonious in all its parts and interactivities. To this proposition the reason and intuition of every well-constituted human mind responds an instant assent. But a reliable conception of the universal *plan* of this complex unity of created being, has hitherto undeniably been a grand desideratum of philosophy; and, reasoning superficially only from the objects which come within the scope of the five exterior senses, and without the aid of any grand fundamental and interior Principle to connect and harmonize all things, in serial and graduated orders, from the common primary cause to ultimate effects—men have cherished theories ever conflicting, ever varying, and necessarily ever disfigured, more or less, with essential errors and imperfections. I have ventured to hope that this defect in the mode of philosophizing might prove to be in some good degree supplied by a discovery, the fundamental principles of which came into my mind some four years ago, in a manner quite extraordinary, but of which I need not now speak particularly. This discovery, which I have called "*the law of the seven-fold correspondential series*," or "*the harmonial scale of creation*," is, to some extent, unfolded and

applied in the present volume, though but a small portion of the evidences of its truth, and the instances of its applicability, are herein exhibited.

The main idea embraced in the discovery referred to is, that each complete system, or sub-system of creation, however great or small, is resolvable into seven serial parts or elemental degrees, corresponding to the seven notes of the diatonic scale; that, as composed of such parts, the systems are arranged side by side, or one above another, as so many octaves, corresponding to the octaves in music; and that, like them, each one serves as a general exponent of all the others, whether on a higher or lower scale. This idea, with its natural adjuncts, of which I can not here speak particularly, by harmonizing and unitizing all natural series and degrees of creation, also clearly illustrates the fact that all truths are involved in, and evolved from, one grand *central* Truth; that they are, indeed, but parts and degrees of that one fundamental truth, which are ultimated in the various forms of embodiment which compose the sum total of created existence. By pursuing the method of reasoning which this idea unfolds, I have endeavored to make one portion of the system of nature expose the secrets of another, and caused visible facts and invisible principles to mutually cast their light upon each other.

That this method might be pursued in the most reliable manner, observations are commenced upon the *surface* of the system of things, composed of those objects which are appreciable to the outer senses, and thence, by facts known particularly to geological and astronomical science, I have endeavored to rationally trace the system of outer being to its origin, to the primal condition of its materials, and to its Divine Cause. Assuming, thus, a position at the center of the universal field of thought, where all principles converge to a common focus, I have endeavored to survey, so far as possible, the vistas of creative development which thence diverge in all directions, and to observe truth in its progressive, serial, and orderly unfoldings, from center to superficies, from generals to particulars, from causes to effects, from origins to ultimates. Finding at this central position, the principles and germs of general unity and systematic order, which *must of necessity* be perpetual throughout all subsequent unfoldings, I have attempted, through a unitary and systematic order of combined analysis and synthesis, to show how the system of creation must have been

gradually unfolded into its present form, and to illustrate the harmonious principles, forms, movements, laws, and interactivities which now characterize it as a whole and in all its parts.

It has thus been the object to draw the bold outlines of a comprehensive primordial philosophy, and to contribute, so far as possible, to the establishment of a system of thought, in which all truths may be viewed in their serial, orderly, and *mutually explanatory* relations, from generals to particulars—a system whose internal, vitalizing principle will constantly tend to the absorption of all truths, and the elimination of all errors, in the same way in which the principles of music constantly tend to the appropriation of harmonies, and the elimination of discords. If I have succeeded even to the extent of unfolding, with *general* correctness, the *most general* principles of such a philosophy, the sure guide-boards and indices to something vastly more perfect of the same kind may be considered as established; and the key to all conceivable truth, whether relating to nature without, the soul within, the spirit world above, or to the Divine Author and Governor of all things, may, in some sense, be considered as in our possession; for no one can essentially err in regard to either of these subjects, so long as he stands in the light of a system which makes all truths the clear and certain exponents of each other.

I would invite particular attention to that feature of the present volume, by which the fundamentals of an elevated theology are preserved and established upon the very basis of those facts in science which have been thought to be rather pantheistic in their intimations.

Following, as it does, in some respects, a comparatively unbeaten path, this Treatise can not, of course, reasonably claim entire exemption from errors and imperfections. Such as it is, however, it is respectfully submitted to a candid and discerning public, with the hope that any criticism it may excite may not be exclusively *destructive*, but in some degree also *constructive*—that it may not only expose errors and imperfections (which should be faithfully done), but suggest *improvements*—so that by the combined intelligence of many, some closer approximations to the truth may be made than I dare presume to have yet attained, notwithstanding the degree of confidence I may have in the *general* correctness of the method which has been pursued, and the results to which it has conduced. W. F.

WILLIAMSBURG, September 7th, 1852.

CONTENTS.

PREFACE	Page 8
---------------	--------

CHAPTER I.

THE COGNIZABLE AND THE COGNIZING.

Interior Faculties—Exterior Objects—At Equipoise—Correspondence of Outer and Inner—Course to be Pursued	11
---	----

CHAPTER II.

DESCENDING SCALE OF TERRESTRIAL FORMS.

The Three Kingdoms—Geological Formations—Descent through the Strata— <i>Alluvial, Diluvial, Tertiary, Secondary, and Transition</i> Formations—Thickness of Strata—Simplicity of Older Fossils—Primary Rocks—Original Fluidity from Heat—Present State of the Earth's Center—Primitive State of the Earth's Materials.....	14
--	----

CHAPTER III.

THE NATURAL HISTORY OF THE SOLAR SYSTEM ANALOGICALLY RETRACED.

Connection of Geology and Astronomy—Common Source of the Planets—Nebular Theory—its Conception by Herschel—Nebulous Stars—Further Proofs of the Theory—Oblately Spheroidal Forms and their Signification—Gradation of Densities—Residual Nebulous Matter—"Zodiacal Light"—Comets—Compte's Calculations—Kirkwood's Law—The Conclusion.....	22
---	----

CHAPTER IV.

THE NATURAL HISTORY OF THE SIDEREAL UNIVERSE ANALOGICALLY RETRACED.

Stars are Suns— <i>Clusters</i> —The Milky Way—The Heavens Sounded—Clusters beyond Clusters—Their Shapes and Densities— <i>Gravitation</i> indicated—Proof of other Laws—Variable Stars—Revolving Double Stars—Immense Periods of some of them—Universality of Revolutionary Motion—Motion of the whole Solar System—Maedler's Central Sun—Still higher Systems—"Magellan's Clouds"—The System of all Systems—The Infinite and the Infinitesimal—Nebular Theory universally Applied—Primeval Universal Chaos.....	31
---	----

CHAPTER V.

MATERIAL BEGINNINGS AS POINTING TO A SUPER-MATERIAL CAUSE.

Matter, as <i>Physical Substance</i> , not Eternal—Logical Evidences of a Spiritual Cause—That this Spiritual Cause was Uncaused, Personal, and DIVINE—Matter Formed from Spiritual Substance—Motion not Inherent in Matter—Must have its Origin in Spirit—In God.....	44
--	----

CHAPTER VI.

PRINCIPLES OF UNIVERSAL SYNTHESIS.

Practicability of a Synthesis—Effects contained in Causes—Material Germs and their Developments—Universal Materiality and Infinite Spirit—Reclamation of Science from Pantheistic Tendencies—Divine Thoughts as Archetypes—Theory of Creation thence deducible—What Man may know concerning God—The “Seven Spirits of God”—Creations hence *Seven-fold*—Universal Correspondences—The *Harmonical Scale of Creation*, and great Musical Organ—The Timbers and the Temple 51

CHAPTER VII.

THE SEVEN FUNDAMENTAL LAWS, AND THEIR INTIMATIONS RESPECTING THE ORIGIN AND STRUCTURE OF THE UNIVERSE.

Primordial Matter—Origin of Motion—Its Seven Laws—Divine Love, Heat, and EXPANSION—Divine Wisdom, Light, and ATTRACTION—Origin of Central Sun—Origin of Rotary Motion—Emanation—Law of CIRCULATION—Law of AGGREGATION—Concentric Nebulous Rings—Their Existing Analogues—Law of SEGREGATION—Segregated Masses—Stellar Clusters formed from these—Confirmatory Celestial Appearances—Immensely of Creation—Analogy of Asteroids—General Formation of *Suns*—Formation of Planets—Summary of Evidences 65

CHAPTER VIII.

THE SEVEN DYNAMIC AGENTS, OR POTENTIAL MEDIA OF NATURE.

Heat, Light, and Electricity—A Corresponding Trinity Inferred—Proved by Reichenbach's Experiments—Flames from Magnets, Crystals, etc.—Seven Colors of their Light—Explains the *Aurora Borealis*—Heat Inferred—*Ethereal Emanations*, and their Singular Effects—“Odic” Heat, and its Offices—“Odic” Light, and its Offices—“Odic” Aura, and its Offices—The Latter a Universal Sympathetic Medium—Its Identity with “Animal Magnetism”—Medium of Divine Action—Divine Embodiment—Distinction between Nature and God..... 91

CHAPTER IX.

DEFECTS OF PREVAILING COSMOLOGICAL THEORIES.

Newton's Idea of a Primary Impulse—Of Centrifugal and Centripetal Forces—Difficulties in respect to the Stability of the System—Their Solution—Lifelessness of Newton's System—It is a Dangerous Machine 118

CHAPTER X.

GROUNDS OF STABILITY AND GENERAL ECONOMY OF THE COSMICAL STRUCTURE.

New Theory Propounded—Illustrations—*Life of the System*—No Vacuity in Space—Equilibrium—Recuperative Force, etc. 119

CHAPTER XI.

PARTICULAR CONSIDERATIONS CONCERNING THE GENESIS AND MODUS OPERANDI OF THE SOLAR SYSTEM.

The Solar and the Universal Systems—Origin of Comets—The Zodiacal Light.... 123

CHAPTER XII.

SYNTHETICAL VIEW OF THE ORIGIN OF THE EARTH, AND ITS GEOLOGICAL FORMATIONS.

Seven Stages of Progress—The CHAOTIC STAGE—Nucleation of Earth and Moon—Polar Opposition—Analogy of Binary Stellar Systems—Common Ethereal Envelope—Effects on Somnambulists, etc.—Common Center—Modified Theory of Tides—SECOND STAGE—THIRD STAGE—FOURTH STAGE—Atmospheric Conditions—Early Scenery Described—FIFTH STAGE—New Red Sandstone—Frost-marks, Bird-tracks, etc.—Diversity of Seasons—Marsupials—SIXTH STAGE—Inorganic and Organic Progress—SEVENTH STAGE, and Completion..... 131

CHAPTER XIII.

THE GEOLOGICAL AND THE MOSAIC REVELATIONS.

Antiquity of our Globe—Alarm of Theologians—Truths must Harmonize—Theology and Science—Principles of Interpretation—Meaning of "Day"—Work of First Day—Second Day—Third Day—Fourth Day—Fifth Day—Sixth Day—Sabbatic Period—Coincidences—Correspondential Classification..... 143

CHAPTER XIV.

THE MINERAL KINGDOM, OR THE KINGDOM OF CHEMICAL FORMS.

Its Seven Divisions..... 169

CHAPTER XV.

THE VEGETABLE KINGDOM.

Its Seven Divisions..... 172

CHAPTER XVI.

THE ANIMAL KINGDOM.

Its Seven Divisions..... 175

CHAPTER XVII.

THE WHOLE AND ITS PARTS.

Generals and Particulars—Comprehensive Classification—Illustration by Prismatic Colors—The Temple Erected 177

CHAPTER XVIII.

DUALISM OF PRODUCTIVE FORCES, OR THE DIASTOLE AND SYSTOLE OF NATURE.

The Two Fundamental Forces—Examples in the Coemical, Mineral, Vegetable, and Animal Creations—Facts in Embryology—Progress of Organization—The Principles Generalized—The Diastole and Systole—Ultior Laws 185

CHAPTER XIX.

CIRCLES.

The Principle of the Circle applicable to all Things—Wheels within Wheels—The Machine not Self-propelling..... 184

CHAPTER XX.

THE DOCTRINE OF DEGREES.

Swedenborg's Philosophy—Degrees "Continuous" and "Discreet"—Improvement suggested—Facilitates Investigation 200

CHAPTER XXI.

THE DOCTRINE OF CORRESPONDENCES.

Foundation and Laws of Correspondences—Importance of the Doctrine..... 208

CHAPTER XXII.

THE DOCTRINE OF PROGRESSIVE DEVELOPMENT.

A pending Controversy—Theory of the "VANGUARDS OF CREATION"—Arguments for Law- Creations—The Nebular Hypothesis—Chemistry—Geology—Fossiology—Plant-like Crystallizations—*Arbor Diana*—Spontaneous Germination—Transmutation of Vegetable Species—Entozoa—Animals Developed by Electricity—Rudimentary and Incidental Organs—Analogy of Human Foetal and Zoological Developments—Theory Deduced—Opposition Excited—Its Grounds—Aspects of the Question..... 211

CHAPTER XXIII.

**FURTHER VIEW OF THE SYSTEM OF LIVING FORMS, AS SUGGEST-
ING ITS MODE OF DEVELOPMENT.**

The Light of our Philosophy—Progression and Retrogression—Embryonic Forms— Their Progress and Significance—The Great Tree—Genesis of Animal Kingdom 224

CHAPTER XXIV.

LAW AGENCY AND DIVINE AGENCY.

Law Defined—Its Universality—It is not Force—Archetypes and their Clothing—Hu- man and Divine Builder—Divine Dwelling-places—Creation did not Develop itself —Diagrammatic Illustration—Overthrow of Pantheistic Speculations 284

CHAPTER XXV.

PROVIDENCES.

Providences are Law-governed—Media determine Modes of Divine Action—Recep- tacles modify Influence—The "Light of the World"—New Beginning Principle— Miracles—Truths Sacred wherever found 249

CONCLUSION OF THE VOLUME 268

THE MACROCOSM;

OR,

THE UNIVERSE WITHOUT.

CHAPTER I.

THE COGNIZABLE AND THE COGNIZING.

THE starting point of all thought and investigation with every human being, is his own interior consciousness. This, to every one, is the most absolutely fixed of all facts—the most positively certain of all certainties; and it is hence the position from which all other certainties and uncertainties, probabilities and improbabilities, possibilities and impossibilities, are estimated. But as from our individual centers of consciousness and intellection, we open our eyes and look without us, we find ourselves surrounded by appearances of various forms and conditions, near and remote, which act upon our physical, intellectual, and moral natures, and are reacted upon by us; and these active and re-active influences are, in some sense, at a constant equipoise. There is thus a universe *without*, and a universe *within* us—a universe of cognizable forms, principles, and conditions, and a universe

12 THE COGNIZABLE AND THE COGNIZING.

of cognizing faculties, the one being related to, and corresponding with, the other. It is a legitimate object and privilege of every inquiring mind to understand, in some degree, both of these universes; and in order to do this to the fullest extent, one must investigate each with a constant regard to its analogies with, and relations to, the other. For the purpose of mapping out, if possible, certain great outlines of the one united and harmonious system of truth as embracing both of these departments, an investigation of this kind is now proposed.

The forms of the outer universe are included in a few simple and comprehensive classifications, as they are arranged above or beneath each other in the scale of creation. Those beneath man, and which at present form the special subject of investigation, are embraced in the comprehensive divisions of animal, vegetable, mineral, geological, and astronomical or cosmical forms. Of these, singularly and in united groups, together with their more superficial properties, the interior soul gains a perception through some one or more of the sensational channels, known as *Touch, Taste, Sight, Hearing, and Smell*. Proceeding upon the basis of the impressions received through these avenues of sense, the *ratiocinative* faculty becomes the medium of some knowledge of the purposes and mutual relations of these, and of the laws by which they are governed; and, availing itself of the contributions of both Sense and Reason, at the same time that it draws, from its own interior and independent resources, the faculty of *Intuition* decides upon their causes, their life forces, and their more interior significations.

Conforming, therefore, to what, in this work, will be recognized as the true method of reasoning, it shall be our first

endeavor, by the aid of Sense, Reason, and Intuition, to trace *analytically* the *descending* scale of creation, from exteriors to interiors, from effects to causes, from ultimates to origins. If we can succeed by this process in establishing any reliable conclusions relative to the first, the elemental, and hence germinal form and condition whence sprang this universal system of things, we may then, in the light of these conclusions, proceed to retrace our steps *synthetically* upward, through the successive series and degrees of natural unfolding, and in a general way discover *how* the system of creation, in its present completed form, came to exist, and also what are the prominent principles of its constitution and government. It is obvious that these combined processes of Analysis and Synthesis, if correctly pursued, will be far more efficient in unfolding the principles and laws harmoniously pervading and governing all parts of the united system of things, and in exhibiting the vital relations and sympathies subsisting between all forms and kingdoms of nature, than either one of these processes pursued singly, and without reference to the other.

In pursuing this process of inquiry, strict attention, of course, shall be paid to facts and principles already firmly fixed upon a true scientific basis: but so long as these are made the basis of further reasoning, and the line of investigation is pursued in strict obedience to the established laws of induction and the intuitions of the interior mind, I shall not consider myself restricted from exhibiting, and, in some instances, perhaps, even insisting upon, the conclusions to which this process may conduct, even though these may, in many cases, be unknown to the prevailing philosophy.

CHAPTER II.

DESCENDING SCALE OF TERRESTRIAL FORMS.

Among the systems of forms which surround man in the outer world, that most immediately related to him, and next below him in the scale of creation, is the *Animal Kingdom*. Immediately beneath this, serving as a substratum on which it rests, and the source from which it derives its subsistence, is the *Vegetable Kingdom*. This, again, rests upon the *Mineral Kingdom*, from which, as the next degree below it in the scale of existence, it derives its nourishment and physical support.

Then, beneath all these kingdoms, as an anterior condition on which their physical developments, as *complete systems*, necessarily depend, is the system of *Geological Formations*. These consist of various gradations, or of lower and higher stratifications, which were developed by degrees, and in successive periods of time. Each geological formation above the primary, contains petrifications of plants and animals of a degree of organization corresponding to the degree of progression in the earth's crust marked by the particular stratification in which they are found, the lowest organizations being associated with the most ancient fossiliferous rocks, and the highest with the most recent, showing a coincident progress in the inorganic and organic developments. Let us now trace downward the various geological stratifications, from highest to lowest, in order that our minds may, by successive steps, be conducted

to the terrestrial conditions which preceded them all, and served as the material Germ of their unfolding.

If we could find a section of the earth's crust in which all the geological stratifications existed in their completeness, and were arranged on horizontal planes, in their natural order of superposition, and if we should then proceed to dig vertically downward through the strata, we would first pass through layers of loam, fine sand, and gravel, of no very great or very definite thickness. We might find in this deposit the remains of plants and animals of existing species, together with the remains of man and of his works. This is the most recent, or what is called the *Alluvial Formation*. Next we would penetrate an irregular deposit of clay, sand, gravel, and small and large stones, more or less rounded by friction, and which is called the *Diluvial Formation*. We would next pass through layers of clay, sand, gravel, marl, etc., in greater or less degrees of consolidation, portions of which abound with the remains of animals and plants of species now mostly extinct. These deposits have been roughly estimated as having the aggregate thickness of about thirteen hundred feet, and constitute what is called the *Tertiary Formation*. Next we would penetrate through deposits of chalk, and strata of marlstone, ironstone, red sandstone, etc., to the depth of not less than five thousand feet, exhuming, as we proceeded, the remains of huge saurians and other animals of a comparatively low organization, and which became entirely extinct before the next superior formation commenced. These strata, with their distinctive fossils, are comprised in what is called the *Secondary Formation*. We would then descend through a system of deposits of not less than three thousand feet in thickness, consisting of strata of limestone, slate, ironstone, and mineral coal, constituting what is called the *Coal For-*

mation. We would after this descend, in succession, through strata of limestone, called the mountain or carboniferous limestone; through what is called the Old Red Sandstone, and thence through what is known as the Silurian and Cambrian systems of deposits. These stratifications, taken together, have been estimated by Dr. John Pye Smith, as measuring a thickness of not less than one hundred and thirty thousand feet. They abound with fossils which, with perhaps slight exceptions, and these confined to their higher portions, are exclusively marine; and the character and magnitude of some of these, and their invariableness of size and constitution as they occur in all latitudes, show that a high and unvarying temperature prevailed on all parts of our globe during the period when they flourished, which could not have depended, in any great degree, upon the solar rays, but is generally supposed to have been caused by radiations from subterranean fire, then more intense than at subsequent periods. This whole series of stratifications has been called the *Transition Formation*, comprising, in the period of its production, those changes in the physical conditions of the earth's surface, which were necessary to qualify it for the production of terrestrial vegetation and the healthy sustenance of air-breathing animals.

This completes the enumeration of the fossiliferous stratifications, which, according to some estimates, are of an aggregate thickness exceeding twenty miles! These all, including the remains of the plants and animals which subsisted during their respective epochs, were quietly deposited at the bottoms of oceans, estuaries, and lakes, and subsequently consolidated and petrified, and thus, as faithful records of the natural history of our planet, they have been preserved through the untold ages which have elapsed from the period of their living existence until present time!

As we have thus proceeded through the descending scale of geological and palæontological creations, we have seen that animal and vegetable organisms, whose remains are entombed in the rocks, become more and more simple. In the lowest of the fossiliferous rocks, the principal animal remains are of the class called the *Radiata*, which somewhat resemble plants, and form the connecting link with the Vegetable Kingdom; while the plants are mainly of a simple species of sea-weed, called *fucoides*. It is, however, presumable that more minute, and still more simple species preceded these, but of which, in consequence of the delicacy of their texture, all traces have become obliterated.

Immediately beneath the fossiliferous rocks, we came to thick strata of clay slate, hornblende slate, mica slate, gneiss, etc., which contain no organic remains, and are called the *Primary Stratified Rocks*. Immediately beneath these lost strata, lies the *Granite*, which is unstratified, and appears to be the original and parent rock, from the comminuted and pulverized materials of which, combined with materials descending from the atmosphere, and evolved from the central mass of the earth, all the stratified rocks were subsequently formed.

Some of my readers, who have not made geology a particular subject of study, may be disposed to inquire whether any one has thus actually digged into the earth to the depth of over twenty miles, and ascertained the character and order of geological formations to be as I have described them? I answer, no; nor would such a mode of exploration have been necessary. Owing to the immense and frequent disturbances to which the earth's crust has been subjected, in different ages, from the explosive forces of internal fires, all the older strata have, in various places, been broken, and their upheaved

edges have thus been exposed at the surface of the earth, and may be measured with little difficulty. And, although in most, if not all, places, some of the strata are wanting, yet, by observing a number of the associated links in the chain of development in one place, and connecting and matching them with corresponding sections of the chain found in other places, and which extend higher or lower, the whole series may be, and has been, re-constructed with approximate accuracy and certainty. And by comparing the lithological characters of rocks, and especially the fossils which they contain, it is found that the order of development is invariably such as I have described, and is the same in all parts of the world.

It was said that the Granite, which seems to be the oldest of the rocks, underlying, as it does, all the stratified series, is itself *unstratified*. This is true, also, of its various modifications in the Porphyry, Basalt, and Greenstone. These rocks, therefore, could not have been formed, as other rocks were, by sedimentary deposits at the bottom of oceans and lakes. On the contrary, they bear unmistakable evidences of having been originally in a molten state from the action of intense heat. That no links may be wanting in the chain of our further inductions, some of these evidences require to be briefly stated, as follows:

It appears that, in many instances, after thick beds of stratified rocks, including some of the older members of the fossiliferous series, were formed immediately over the granitic rocks, the latter have flown upward, not only in hemispherical and conical, but sometimes in sharply angular forms, displacing the superincumbent strata, and producing mountain elevations. In the upheaving effort it has, apparently by injection, filled up the smallest crevices of the contiguous rocks, fre-

quently bursting through them in various directions, forming "dykes" and veins with numerous branches, from an inch to hundreds of feet in diameter; and, coming up frequently through the entire thickness of the strata, it has flown over the top, where it has, often in large masses, subsequently consolidated. These dykes are often found to contain imbedded fragments of the identical rocks through which they appear to have forced their passage in their upward movement. The manner in which these fragments are imbedded, proves to a demonstration, that the mass by which they are surrounded was once in a *fluid state*, and that it subsequently became solid, as we now find it.

That the original fluidity of these injected rocks was produced by *heat*, is evident from the following, among other considerations: 1. The crystalline character of some of these rocks is such as could have been produced only by heat. 2. The chemical effects produced upon the stratified rocks by contact of the unstratified ones, are similar to those produced by dykes of recent lava. 3. The different unstratified rocks insensibly pass into each other, and indeed into modern lavas. Besides, the mineral composition of the rocks, as well as the form and position of the dykes, shows that their original fluidity could not have been the result of *water*, which is the only known natural element besides fire, to which their solution could possibly be attributed in any case.

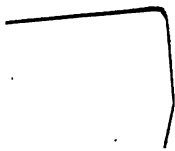
But as the rocks of which we have spoken are *primary rocks*, and serve as the basis of all stratified rocks in all places, and as they must, therefore, have universally prevailed over the surface of the earth before any other rocks were formed, if their original state was that of igneous fluidity, it may be assumed that such was the condition of the whole globe—that it was one vast ball of molten lava! This is now gener-

ally the opinion of geologists, and is confirmed by the following, among other considerations:

1. The earth is not a perfect globe, but an oblate spheroid, flattened at the poles—the polar diameter being about twenty-six miles shorter than the equatorial. This is the form which it would necessarily have assumed from the centrifugal force caused by diurnal revolution, supposing it to have been originally in a fluid state.

2. There is good evidence that our planet is still a vast ball of liquid fire, surrounded by a thin crust, which, in thickness, bears no greater proportion to the general mass of the earth, than the egg-shell bears to the general mass of the egg. From careful observations which have been made during many years, upon the temperature of deep mines and the waters of artesian wells, in various parts of the world, it is found that, after descending *beyond* the reach of solar influence, the temperature *invariably increases, in all places*, at the average rate of about one degree Fahrenheit for every forty-five or fifty feet of descent. And this rule uniformly holds good to the greatest depths to which the earth has been penetrated.

Now, assuming fifty degrees as the average temperature at the surface of the earth, and taking the mean ratio of increase at one degree for every fifty feet of descent, we should, at this rate, at a depth of a little more than sixty-five miles, reach a temperature of seven thousand degrees, which would be sufficient to melt all known rocks. Supposing this state of igneous fusion to extend from the comparatively thin crust of the earth on all sides, to the center, we have still a mass of molten lava of more than seven thousand miles in diameter. If we suppose this mass to become sometimes agitated in its higher portions by internal gasses, or by the percolation of water through fissures in the superincumbent strata, we have a sufficient ex-



planation of earthquakes, volcanic eruptions, and of the immense mountain upheavels which have occurred at different epochs during the geological formations; while, aside from the hypothesis of internal fusion, the solution of these latter phenomena would be extremely difficult, if not impossible.

Thus have geologists reasoned, from substantial data, concerning the early state of our planet. But, though at this point the data of retrospective reasonings become less certain than those which have hitherto guided us, we may presume, as highly probable, not to say absolutely certain, that not even *this* was strictly the *primitive* state of our planet—that the matter which composes it was in conditions anterior and germinal even to this; and if we extend backward our chain of analogical inductions *in a direct line*, it will lead us to a condition of still more intense heat—heat that would be compatible only with the existence of matter in the form of *vapor*. It is, then, to say the least, an hypothesis certainly not *unreasonable*, that the matter of our earth was once in the state of igneous gas, from the cooling and condensation of which it assumed successively the fluid, and then its present superficially solid state. But for the present we offer this *only* as an hypothesis to which analogies thus far developed, directly point. Such further and more conclusive evidences of its truth, as scientific data now afford, will be incidentally brought into view as we proceed.

CHAPTER III.

THE NATURAL HISTORY OF THE SOLAR SYSTEM ANALOGICALLY RETRACED.

ADMITTING that the foregoing hypothesis as to the original condition of the earth's materials has any foundation in truth, we find in it the link which connects geology with astronomy. It must be borne in mind that the earth is only one member of the great family of planets belonging to the solar system ; and it is fair to presume that the brothers and sisters of the same planetary family have the same, or a similar, origin—especially as they have the same oblately spheroidal form, and observe the same laws of diurnal and orbital revolution. If the earth, then, was originally in a state of igneous gas, so (we may suppose) were *they* ; and before the incipient processes of spheroidation commenced, the materials of all of them may have commingled, and probably *did* commingle, together in one undistinguishable mass.

Though this hypothesis of an original gaseous state of the earth and planets rests upon a foundation of its *own* (being a portion of the chain of analogous developments prolonged directly backward from the links of substantial geological facts), it is precisely in accordance with the *nebular theory* of the origin of worlds and systems, which theory also rests upon independent grounds of reasoning. As a conviction of the general truthfulness of this theory is important as a basis of ulterior ideas to be presented in this treatise, the patient

attention of the reader is solicited while we briefly explain its nature, and unfold a summary of the evidences on which it is founded.

The idea that nebulæ, or loose masses of fiery vapor, which seemed to be floating in the depths of immensity, might form the materials out of which nature elaborated suns and planets, was originally propounded as a conjecture, by Sir William Herschel; but it was subsequently brought into more definite and tangible form by Laplace, Comte, Nichol, and others. The theory supposes that loose masses of nebulous vapor, at first without definite form or movement, gradually assumed, by virtue of gravitation, a regular spheroidal and rotating form, lightest at the circumference, and gradually increasing in density toward the center, at which point the greatest density is attained. It supposes that such forms were the original forms of suns—that the substance of these, in this diffused state, originally extended from their present condensed, solar spheres, to the outermost limits of the planetary systems which now revolve about them; and that by the combined processes of rotation and further condensation, successive and concentric rings were formed on the outer limits of the nebulous disks, of which we have a faint illustration in the rings of Saturn. These rings, it is thought, subsequently became broken up, when the matter composing them naturally agglomerated into spheres, which, by an analogous process of condensation and evolution of rings, produced planets and their satellites.

It is but just to remark that many of the supposed *nebula* which Herschel thought might form the materials of future suns and systems, have subsequently, by the application of powerful telescopes, and especially that of Lord Ross, been resolved into stars, apparently so close together as to cause the general hazy appearance which they present when viewed

with the naked eye, or through a telescope of low power. It is reasonably suspected that many of the still unresolved nebulae might yield to a still higher telescopic power, were such available to science and art; and acting upon this supposition, some few astronomers have abandoned the nebular theory, in which they previously believed, and attempted to prove its impossibility. But in reference to this change of astronomical faith from *such* a cause, Professor Michell forcibly remarks, that "Herschel only adopted the [nebular] theory after he had resolved many hundred of the nebulae into stars; and, if there ever existed a reason for accepting the truth of this remarkable speculation, that reason has been scarcely affected in any degree, by recent discoveries."

The phenomenon of *nebulous stars*, especially, still remains in its unimpaired force, as an argument for the probable truth of the theory in question. These stars are spherical bodies, bright in the center, from which there is a gradual shading off into undistinguishable dimness as the circumference is approached. They exist in all degrees of apparent concentration, from a diffused blur with a no very distinct nucleus, to a well defined star surrounded by a haze. What can these bodies be but masses of primeval matter, in various degrees of progression between their original, or most chaotic state, and that of fully developed suns and planets? But these are precisely the various conditions which the nebular theory supposes to take place during the different and progressive stages of the process by which suns and planets are ultimately formed.

A brief summary of the further proofs of the nebular theory may be presented as follows:

1. It has already been remarked that the earth is an oblate spheroid, flattened at the poles and bulged at the equator.

This same fact is also observed in relation to other planets, the *outer* ones, owing to the greater rapidity of their rotatory motions, being much more bulged and flattened than the inner ones. To the writer it is not a little surprising that this form of planetary bodies has not, of itself, established among astronomers the universal conviction that these bodies were formed by a *contraction* of their materials from a previously diffused state. Such, it appears, must necessarily have been the case, if their superior equatorial diameter had, in its origin, any connection with the centrifugal force produced by rotatory motion. For if the materials of the planet, while in an originally globular form, had *commenced* being thrown *outward* at the equator, by the centrifugal force generated by revolution, no known counter-force could have prevented them from being all, or nearly all, thrown outward, and continually farther and farther from the center, until the planet would have lost its identity. Especially would this have been the result, if the original velocity of revolution had continued undiminished. For it is evident that the farther a particle, or collection of particles, is thrown from an axis around which they, in a given period, may revolve, the greater is the centrifugal force generated by the rotation, and hence the greater is its tendency to fly off still farther; while, on the other hand, the farther a particle is thrown from a center of attraction, the less becomes the attractive or centripetal force to retain it from flying off still farther.

The forces which produced the bulged form of planets at the equator are undoubtedly the same as those which produced the rings of Saturn. Now, the rings of Saturn complete a revolution in 10 hours 32 minutes and 15 seconds; while the primary itself revolves in 10 hours 16 minutes and 1 second, or in a period of only 16 minutes and 14 seconds

less. If, therefore, there was originally generated, by rotatory motion, at Saturn's equator, an amount of centrifugal force sufficient to throw off particles to the present position of the rings of that body, certainly the *immensely increased* centrifugal force generated by the revolution of those rings in about the *same period*, would have thrown the *same* particles still farther, and would probably have dissipated them into chaos—especially as the attractive force of the primary, at that distance, must have exerted considerably less influence upon them.

The same reasoning applies with equal force to that ring, or circle of *attached* matter, which rises above the line of sphericity at Saturn's equator, and also at the equators of other planets, and of the earth. The acting forces are of the same nature, and bear similar relations to each other in both places, the only difference being a difference in the degrees of intensity with which they act in the different positions.

These considerations show that in all stages of the process by which planetary bodies were formed, the *attractive, contractive, or centripetal force, had decided predominance over the centrifugal*. Supposing the two forces to have always acted together after both became established, the centrifugal force, it is true, must have always *restrained* and *modified* the intensity of the centripetal, in the direction of the plane of rotation, but could never throw farther into space a particle which the centripetal or attractive, had succeeded, in defiance of the opposing, force, in bringing from a greater to a less distance from the center.

The bulged form of the earth and other planets, therefore, *could not* have been produced by a *throwing out* of particles at the equator, but rather by a *drawing in* of particles from the poles, where the attractive force was comparatively unre-

strained by the centrifugal; while this latter force, attaining its maximum at the equator, meets and wards off the gravitating particles in their rush toward the center, and thus the two forces finally settle into an exact equipoise, of which the oblately spheroidal form of the planet is an equally exact expression.

These considerations seem to sufficiently prove that the earth (before shown to have been originally in a state of igneous, if not gaseous fluid) was formed by the predominating force of attraction, and hence *contraction*, acting upon materials in a rarer state, and reducing them to their present dense form. The attractive and contractive operation must, of course, have proceeded through a progressive series of analogous stages, which somewhere must have had a *beginning*; and we can not conceive of any possible beginning short of the greatest possible diffusion—a state of diffusion which, originally applying to the materials of all planets, must have brought them all into the form of one common vapory mass.

Though this argument, in proof of the nebular theory, seems hitherto to have generally escaped the notice of astronomical writers, it is one which, nevertheless, deserves to be pondered and borne in mind.

2. Another argument for the same theory, is derived from the regular gradations of densities of planets, from innermost to outermost. Thus it is stated, on the basis of mathematical calculations, that Mercury must be about the weight of so much lead; Venus is nearly six times the weight of so much water; the Earth, as a whole, is four and a half times the weight of water; Mars is a little over three times the weight of water; Jupiter is a small fraction over the weight of so much water; Saturn is less than half that specific weight, or

about the weight of so much cork ; and Herschel manifests a corresponding decrease of density. This regular gradation in the specific densities of the planets, in the order of their occurrence, from innermost to outermost, is precisely what it should be, supposing that they were all formed by the operations of a common law, from an original sphere of fluid matter, which must have been most dense near the center, and most rare on its outer extremities.

There is a similar relation between the *distances* of the different planets; for, proceeding outward from Mercury, each successive planet (including the asteroids as equivalent to one planet) is about *double* the distance of the previous planet from the sun. This curious relation of distances seems, in like manner, to argue their production by a common cause, and by the operations of a common law, of which the only explanation yet found seems to be given in the nebular theory.

3. If the theory in question is admitted as the true one, it might accordingly be supposed, that after the evolution of Mercury, which is the planet nearest the sun, there would still be a residuum of nebulous or planetary matter in an unformed state, surrounding the more dense mass of the sun. Accordingly there actually appears to be an extensive mass of attenuated matter surrounding the sun, and is sometimes visible immediately after sunset, or before sunrise, as a conic, luminous streak, projected from the horizon in the direction of the path of the sun, and which is called the "Zodiacal light."

4. There are still many planets, or *wandering* celestial bodies, in a *nebulous state*, in which state they are called "comets." These appear to have been formed from a residuum of attenuated matter, after the agglomeration of the denser materials took place.

5. M. Comte, of Paris, has proved, according to principles by which periods of rotation maintain a relation to the mass of the given rotating body, that the sidereal year of each planet actually corresponds to the period in which the sun must have rotated on his axis, supposing his mass to have extended to the orbits of such planets; and he also ascertained that the periods of rotation of the primary planets with their mass, in a state of vapor, extending to the orbits of their satellites, must, in like manner, have corresponded with the present orbital periods of those satellites.

6. A new planetary law has recently been discovered by Mr. Kirkwood, which seems to have an important bearing on the question at issue. This law, as I understand it, is, that the square of the number of rotations of any given planet in its year, is to the square of the number of rotations of any other planet in its year, as the cube of the diameter of the sphere of attraction of the first planet, is to the cube of the diameter of the sphere of attraction of the second planet.* Thus, for instance, the number of rotations of the earth in its year, bears a definite relation to the quantity of matter (or the amount of attractive force) in the Earth, in Mars, and in Venus.

Here, then, is an indication of another relation existing between the forces and movements of the different planets, so definite as to preclude every reasonable supposition that it came by *chance*, and a relation which, in common with facts before noticed, seems to refer all the planets to a common parentage, and common law of production, which is accounted for only by the nebular theory. Certainly so many remark-

* The sphere of attraction of a planet, is a circle whose radius is determined by the point between two contiguous planets in conjunction, where an object would be attracted to neither of them, but would be exactly poised between the two contending forces. For an account of Kirkwood's discovery, see Silliman's American Journal of Science, Vol. ix., Second Series, p. 395.

ably concurrent facts, pointing to the same conclusion as to the origin of our planetary system, can not reasonably be set down as so many mere fortuitous coincidences.

Finally, the theory in question is the only one which does not either involve inexplicable and inconceivable mysteries, or suppositions totally unfounded in any of the known laws of causation. This theory, on the other hand, commends itself to human reason and intuition, without being encumbered with any serious difficulties; and, as it is confessedly unphilosophical to look for an explanation of a phenomenon *without* the sphere of known natural laws, when a full explanation may be found within the sphere of those laws, the nebular theory may be considered as *established*, at least until it is invalidated by further discoveries.

CHAPTER IV.

THE NATURAL HISTORY OF THE SIDEREAL UNIVERSE ANALOGICALLY RETRACED.

FROM contemplations of our own solar system, let us now extend our observations and reflections into the immeasurable realms of the stellar universe beyond, and see what gleams of light we can obtain in reference to the natural history of that grand System of systems, of which our own congeries of worlds forms, as it were, but an atom. Facts and analogies which need not here be particularized, have established the universal belief among astronomers that the so-called "fixed" stars are but so many remote suns shining to other systems. These are not distributed equally through the celestial spaces, as though they had been scattered at random from an Omnipotent hand; but they are arranged in distinct *clusters*, or firmaments, so called, which have little or no apparent connection with each other. Telescopic observations have proved that the bright girdle called the "Milky Way," which surrounds our heavens, is only a grand congeries of stars, so remote, and owing to their remoteness from us, apparently so near to each other, that their intermingling rays reach us only in the appearance of a confused whitish light. Of this vast zone of shining orbs, all the less remote stars, including our own sun, are members, their varying directions being, in a measure, the result of differences in their distances from the point of observation, and hence, of the different angles at which they are viewed.

Not only have the relative distances of various portions of this grand cluster been proximately determined, but the spaces beyond have been sounded. The process by which these results have been accomplished, may be easily brought within the reader's comprehension by the following illustrations: Suppose any given object is removed from a point of observation to a distance at which it is barely discernible by the naked eye. Now, a telescope which has the power of penetrating space to ten times the distance that can be reached with the naked eye, would show that same object, with the same degree of distinctness, ten times as far off. Take, then, a telescope of twenty degrees of space-penetrating power, and remove the object twenty times its first distance, and it will still be seen with equal distinctness and apparent nearness. And so also of still larger telescopes and correspondingly farther distances.

Now, when we gaze into the heavens on a clear night, with the naked eye, we observe, in any given portion of the Milky Way a distinct number of stars, the faintest of which are barely discernible. If the astronomer, then, takes a telescope of ten powers, as compared with the unassisted eye, and surveys the same field, all the stars before observed will appear with increased brilliancy, besides which many more will be visible, the remotest and faintest of which may be presumed to be ten times as far off as the farthest ones which previously appeared. He then takes a still larger telescope, and still more objects appear, the remotest of which may, in like manner, be presumed to be situated in a relative depth of space proportioned to the increased degree of telescopic power. So correspondingly of a larger, and still larger, instrument, until one is obtained which reveals no more stars, but only shows those in the same field of view, in increased brightness. The

space-penetrating power is again augmented, and still no more stars are brought into view. The observer, therefore, legitimately concludes that he has reached the *outer limits* of the great cluster to which we belong, and is now traversing the blank void beyond.

But is he to conclude that he has sounded the system of stellar creations to its remotest depths, and that beyond these boundaries, there are no more vestiges of the Creator's energy? Let him augment the optical power but one degree more, and perhaps in the dim and awful distance he will behold a faint and scarcely discernible speck or streak of whitish light. In the excitement of irrepressible curiosity, he hastens to direct to the spot the largest telescope the observatory affords, and that same whitish spot glows into myriads of beautiful stars—another galaxy or Milky Way—another firmament, perchance, displaying its glories to its own unnumbered worlds, and pealing its own notes of silent harmony, responsive to the movements of all kindred systems!

As by the indefatigable exertions of the two Herschels, the heavens have been swept by the telescope in all directions, more than two thousand five hundred of these isolated stellar systems have been brought to light, some smaller and some larger than the grand cluster in the midst of which our own sun and system are situated.

Let us now look at some of the phenomena which these vast starry congregations present, and from which inference may be drawn as to whether, in regard to their internal structure and laws, and hence their modes of origin, they have any thing in common with our own solar system, and whether the analogies of one may be applied in unfolding the mysteries of the other.

And the first thing that naturally attracts attention in such

an investigation, is the shapes and apparent relative densities of these starry clusters. By telescopic measurements of relative distances in relative directions, accomplished in the manner before illustrated, Sir William Herschel decided that the great cluster, of which our own sun is a member, and of which the greater portion of stars, owing to their immense distances, seem to rest on one general plain, and surround us in the great zone called the "Milky Way," is of an irregular form, approaching that of a circle, but thick in the middle, and thin toward the edges, in one of which there is a horizontal split or opening. Other clusters are of all conceivable forms, but of these forms the round, or oblately spheroidal, most prevails. Even in elongated, curved, angular, and branching clusters, there are often apparently several centers of incipient rotundity. Generally these centers are well defined, and toward them the stars, though with an inappreciable motion, are apparently flowing from all directions, becoming thicker and more compressed as they approach, and being thinner, and gradually shading off into invisibility, at more distant removes.

The general uniformity in the appearances of these spherical aggregations, and especially of their comparative denseness in the center, which thence gradually and regularly diminishes, in all directions, toward the circumference, shows that their aggregation is governed by some grand law; and what can this be but the familiar law of *Gravitation*—that identical law which, in the same form of action, is so potent in our own system, giving sphericity to every collection of fluid particles, from those which compose the planet, to those which form the dew-drop? It is gratifying to find in those remote creations such distinct indications of a property which is possessed in common with our own system, and which binds the nearest

and remotest forms in the celestial spaces, in one common bond of sympathy and brotherhood.

But the discovery of the law of gravitation, as applicable to these distant worlds as well as to the orbs of our own planetary system, naturally engenders the presumption that the *whole series* of laws and general operations with which gravitation is here necessarily connected, applies to them also, with little or no modification. And a further inquiry will disclose celestial phenomena which tend greatly to strengthen this presumption, if not to convert it into a positive conviction.

Contemplating our own solar system, we are struck with the fact that revolutionary motion every where prevails. The planets are constantly whirling upon their axes, and performing their grand orbital circuits in the heavens. The sun himself rotates upon his own center, once in about twenty-seven days. This revolution has been ascertained by the periodical variation of the position of spots on his disk.

But several of the stars of our firmament exhibit a phenomenon similar to this, from which our sun's rotatory motion has been inferred. That is, they alternately, and in *regular periods*, give forth a greater and a less degree of light, as though they had a brightest side and a side of a less degree of brightness, which were alternately, and at regular intervals, presented to us by a revolution upon their axes. This is one of the facts which have confirmed astronomers in the otherwise very natural presumption, that the stars are suns like our own, and whose apparent diminutiveness is only owing to their immense distances.

There are also many instances in which the varying relative positions of two or more stars are such as to indicate a revolution around each other, and around a *common center*. Some of these stars have vast periods, as, for instance, the double

star Castor, whose constituents revolve around each other in 215 years; Gamma, in the constellation of the Virgin, whose constituents revolve in 628 years; Gamma of the Lion, whose constituents revolve in 1200 years; and Mizar and Alcor, in the tail of the Great Bear, which, according to Professor Nichol, would probably consume not much less than the inconceivable period of 190,000 years in completing a single revolution around each other! Others accomplish their revolutions in much less than 100 years.

By establishing the fact that rotatory and orbital motions are experienced by many of the stars, the extreme probability is at the same time established on analogical grounds, that similar motions are experienced, with, perhaps, some modifications, by *all* stars. We are, at least, not without strong, not to say demonstrative evidence, that motions of this kind are going on in the celestial spaces, on a much grander scale than any we have yet described. By comparing the positions of the stars in the modern heavens with their positions as represented in ancient catalogues, Sir William Herschel found that in one quarter of the firmament, they were apparently drawing nigher together, while in the opposite quarter they were apparently receding from each other. To account for these changing appearances, Herschel conjectured that our own sun, with all his retinue of planets, was moving in some grand path toward a point in the constellation Hercules. After much doubt and many critical examinations, subsequent investigators have succeeded in establishing this opinion on an indubitable basis.

But in the hands of Argelander, Struve, Peters, and especially of Maedler, the theory of this solar motion was made to assume still more definite form. Inferring, with others, from analogy, that the path described by our luminary must be the

curve of an orbit around some remote center, the latter of these astronomers betook himself to the examination of ancient catalogues of stars, with a view to ascertain if there was any discoverable district in the heavens where all the apparent motions of the stars were such as to comply with the conditions which must necessarily characterize a central region. Such a district was found; and the star *ALCYONE*, in the cluster *Pleiades*, was decided to be its center. Around this point, therefore, our own sun, and the whole firmamental cluster to which it belongs, were supposed to be revolving with immense velocity, in orbits coincident with the general plane of the *Milky Way*, and requiring no less than eighteen millions of years to accomplish a single revolution!

Whatever diversity of opinion there may exist relative to the legitimacy of the conclusion of Maedler, which locates the center of alleged orbital motion at the point occupied by the star *Alcyone*, I believe it is now generally, if not universally admitted by astronomers, that such orbital motion does exist around *some* center, not very remote from that region.

The evidence upon this point greatly strengthens the analogy which, of itself, points to the conclusion that those isolated globular and other clusters of stars, situated in the remoter realms of space, and which appear to have been aggregated by internal power of gravitation, are also scenes of perpetual rotatory and orbital motion. Did not these motions, with their resultant centrifugal forces, exist to countervail, in some degree, the force of internal gravity, those firmamental clusters would doubtless exist in much more dense masses than those in which they now appear.

But if this conclusion thus approximates to a certainty, there are facts which point to a still more extended application of its principles. In the southern heavens, and quite

detached from the Milky Way, are two bright spots which southern navigators have designated by the name of "*Magellan's Clouds*." During his astronomical residence at the Cape of Good Hope some years ago, Sir John Herschel, by the aid of his twenty feet telescope, succeeded in analyzing these objects, and found that each of them, and especially the larger one, was a *system of firmaments*, combining many extensive clusters into one! Of these, *as systems*, analogy would authorize us to predicate internal gravity and general and particular rotatory and orbital motions. But the magnitude of this complex unity, however inconceivably great, may, after all, be but an atom in the immensity of ulterior creations to which it belongs; and, on the bases of its analogies, we may rise to the ideal of a still higher system—a system which may be supposed to embrace in its structure all the firmamental clusters, nebulæ, and systems of systems heretofore known to telescopic observers, and countless more besides.

Nor is the idea of such an all-comprehensive system of systems without the support of facts, as well as of analogies. It is said that although nebulæ, resolvable and irresolvable, appear in every quarter of the heavens, they appear in greatest abundance in a comparatively narrow zone which encircles the heavens, cutting the plane of the Milky Way at right angles. This arrangement goes far to establish the idea of a Firmament of firmaments, a Galaxy of galaxies, in which all sidereal creations which have come within the reach of the most powerful telescopes, are bound together in one common structure, brought within the sphere of the same common laws, and made to observe throughout, similar rotatory and orbital motions with those which prevail in our own solar system, which latter may be considered as an epitome and representative of the whole!

We have thus seen that wherever the wonders of the celestial spaces have been distinctly unfolded, the revolution of satellites around planets, of planets around suns, of suns around still greater suns, of systems around still greater systems, of clusters around still greater clusters, is revealed as an omniprevalent law. And seeing the complete unity of plan and harmony of operations so far as we have gone—seeing the affectionate co-relations which are exhibited between molecules, and worlds, and systems, and all stellar congregations, with all their included parts—may we not prolong the chain of analogy one link farther, and conclude that they all, together with the myriads of similar creations which dwell in depths of space which no optical power can ever penetrate, owe the bond of unity which connects them, and the harmonial influence which wields them in their mighty courses, to one grand Source of central power, whose attractions they all implicitly obey, and from whose genial radiations all receive their life? If the links of the analogical chain have been found to closely adhere through all the labyrinths of every realm of being whose existence may be verified by other processes, who shall begin to distrust that chain for the first time, after it has conducted us safely thus far?

Though the hypothesis of a common Pivot and Center of gravity of the whole universe may not, in the nature of things, be susceptible of an ocular or complete mathematical demonstration, yet there is interior evidence—I had almost said even the evidence of intuition—that it is true in *some* form; and I believe this idea is now extensively received as an article of astronomical faith.

Let no one suppose that amid these inconceivable distances and magnitudes, the fixed principles of reasoning lose their validity and become untrustworthy. It is true that in

these giddy flights, the imagination and conceptive powers become lost and bewildered; but so they do, in a great degree, before we have traveled beyond the immediate neighborhood of our own mundane sphere. The distance from the earth to our own sun is measured by millions of miles; and even this, as one of the shortest of astronomical distances, the imagination can but faintly conceive. The distance from the sun to the stars is measured by millions of diameters of the earth's orbit; the distance from firmament to firmament is measured by millions of interstellar spaces; the distance even of the *most interior* firmament from the great Center of all centers, may, in the efforts of the imagination, be measured by millions, or even billions of inter-firmamental spaces; and the circumference of the whole Grand Structure, may even transcend all human conceptions of *infinitude*; yet form, locality, relative position, center, circumference, and hence *limits*, must exist as absolutely as they exist in the smallest spherule of matter visible to the human eye; and to the view of an absolutely infinite Being, the whole Universe of universes may be of comparative dimensions not greater than a single grain of sand! And if Ehrenberg could, by the aid of the microscope, descry a whole animal kingdom in a single drop of water, each individual of the myriads of whose animated forms must have had eyes, teeth, stomach, intestines, and all the appurtenances of a complete anatomical structure, governed by unvarying physiological laws; and if by the same means he could demonstrate that a particular geological deposit, fourteen feet thick and miles in extent, was made up almost exclusively of the skeletons of animals, forty-one billions of which could exist in a single cubic inch, then we may rest assured that the principles of nature exist in no greater completeness, and in no higher or more inconceivable compli-

cations, in *infinites* than they do in *infinitesimals*. We may, then, without crowding out any natural principle, or doing violence to any just method of reasoning, reduce the scale of the universe, in our imagination, to dimensions convenient to be contemplated on all sides, and follow out our reasonings with ease and comparative certainty respecting its properties, forces, laws, internal arrangements, and progressive processes of formation, from beginnings to ultimates.

Considering, then, all general natural principles as applying equally to greatest and to smallest analogous cosmical forms, and to the whole universal structure as well as to its individual parts, we proceed to another branch of the chain of analogical reasoning, which will speedily conduct us to the primal condition of the *substance* from which the material universe and all it contains, was organized.

The nebular theory of planetary and solar formations, as applying to our solar system, has been shown to rest on so many probabilities as seemingly to justify the undoubting conviction of its truth. But if this theory is admitted as applicable to our own solar system, its applicability to formations in the sidereal realms will, after the foregoing system of universal analogies has been traced out, scarcely be disputed, especially as it was in the sidereal realms that the first facts were observed which seemed to intimate its truth. And if all planetary and solar agglomerations originated from previously diffused nebulous masses, then, in view of the unbroken chain which, we have seen, binds all systems together as *one* system, the following statement is its own sufficient proof:

As the satellites were formed from the same original nebulous mass from which the planets originated, so a prior state of that mass was a state of unity and interdiffusion with the mass which composed the sun. The materials of *that* mass,

in like manner, were previously connected and interdiffused with the mass which formed the more *interior* sun around which it revolves, and out of which were formed all such other ultimate suns as, in common with our own, now revolve around the same center. The substance of all suns and systems composing our firmament, may be supposed also to have been previously interdiffused in one amorphous, undistinguishable mass. So the substance of the suns and systems of all other firmaments, together with the substance of the great central sphere of universal attraction which binds and subordinates them all, was, in like manner, in an original nebulous and formless state; and the whole universal substance was then but *one* substance, so highly attenuated and expanded as to be without definite forms, divisions, or compartments—an indefinable, universal MONAD! In short, as our own solar system is a child of the great Universal System, and is formed in the image of its parent, the primal condition of the materials of one, must have been precisely analogous to that of the other; and if the solar system germinated from an original nebulæ, so did the system of the whole universe.

But in thus unraveling the complexity of all material formations, and tracing them all to an original, unitary, and chaotic state, we at the same time unravel the complexity of *motion*, and not only arrive at its original and simplest form, but at a state in which it must necessarily have had *no* form—a state in which its principles were as chaotic as original matter itself, or, what is the same thing, at a state in which *no established motion existed*.

We have thus arrived by an easy, and, admitting our premises, an apparently certain, process, at the very root of the Tree of universal material creations—at the great unitary Germ of all firmaments, suns, systems, and worlds, with the

mineral, vegetable, animal, and human forms which dwell upon their surfaces. If there has been any error in the foregoing reasonings, it has probably been an error in the *form* rather than in the *principles* of our conclusions, and the error therefore does not essentially effect the main object contemplated in this disquisition. But of the truth of the position to which we have arrived by this analytical process, from ultimates to origins, or from effects to causes, additional evidences will hereafter incidentally occur as we proceed, by an opposite and *synthetical* process, from causes to effects. The two processes will serve as mutual correctives of each other; and by the aid of both united, we hope to somewhat enlarge our truthful conceptions in relation to those principles, laws, and operations of the universe *without*, which naturally lie beyond the province of mathematics and ocular demonstration, but which, nevertheless, have their counterparts, representatives, and exponents in the universe *within*.

CHAPTER V.

MATERIAL BEGINNINGS AS POINTING TO A SUPER-MATERIAL CAUSE.

HAVING thus traced the system of material creation through a series of anterior conditions, comprehending periods which, perhaps, no assemblage of arithmetical figures could express, to a state in which the materials of all worlds, systems, and firmaments, were in a condition of diffused attenuated vapor, with no definite or established motions, the inquiry next arises, Was even *this* the absolutely *primitive* state of material things? Did matter ever exist in any *form* or *forms* previous to this state of chaos? or, if not, was it, in this state, eternal? or, if not absolutely eternal either in the state of forms or of chaos, whence and how did it originate?

The idea that matter ever existed in any mundane forms previous to this, and became subsequently dissolved, not only has no analogy to support it, but seems to be contradicted by an established law of nature. I refer to that law by which amorphous or chaotic matter in motion has the general and predominant tendency to assume and multiply *forms*. It is not denied that motion of particles tends also to the *dissolution* of material forms, but that dissolution is always subservient to immediate and higher recombinations. The kingdom of motion and forms, therefore, have ever been, and still are (and we may confidently believe ever will be), making farther and farther encroachments upon the realms of chaos and

inertia; and whatever is conquered by the former can never be *fully* reconquered by the latter. And this is because the former power is positive, and the latter is negative.

If matter, therefore, was ever in a state of mundane or organized forms previous to the chaotic state now under contemplation, it must have for ever continued in that same general state, and even to progressively unfold the tendencies by which its forms were assumed; and no natural power could have brought it back again to the formless state. The chaotic or nebulous state in which we have seen it must necessarily have existed at the beginning of the cosmical creation, may, therefore, be inferred to be its *primitive* state.

But that matter, even in this indefinite state, was absolutely *eternal*, is an idea which analogy, so far as it speaks upon the subject, distinctly contradicts.* The material of each form and kingdom in nature may be traced *backward* from highest to lowest developments, immediately beyond which latter it loses itself in a more rudimental creation, which serves as its groundwork. Thus the animal kingdom, traced downward to its lowest and simplest forms, finally loses its character as animal, and merges into the vegetable; the vegetable, in like manner, finally loses itself in the mineral; the mineral or crystalline forms pass downward into the general amorphous mass of planetary matter; planetary matter may be traced downward through more rudimental geological conditions, and through igneous liquid, and aeriform fluid, until its distinction is lost in planetary nebula; this, in imagination, may be traced, in like manner, until it is lost in the general gaseous mass of the uncondensed sun; and so we may proceed, in retrograde steps, until we find the materials of all forms and

* Let it be remarked, once for all, that by "matter," I mean *physical substance* in contradistinction to *spiritual substance*.

kingdoms are lost in the great common mass of original chaotic matter.

But in thus tracing back all forms and kingdoms to their respective and immediate predecessors, we at the same time trace backward the one and analogous kingdom of *Universal Matter as such* (which includes all the other kingdoms), from its highest to its lowest forms; and as there is a point beneath which all kingdoms lose their identity, and their essences are merged in an anterior kingdom, so analogy would seem to indicate that there is a prior point of attenuation and refinement at which the great kingdom of Matter also loses its character as matter or physical substance, and thus that it originated as matter, from a prior source, as did all its included sub-kingdoms. This idea would appear in greater clearness and force of probability, if contemplated in the light of the doctrine of Series, Degrees, and Correspondences, hereafter to be brought into view; and it will receive incidental confirmation as we proceed to consider the origin of Motion.

If (contrary to an extreme probability, not to say absolute certainty, established in previous remarks) the hypothesis is still insisted upon, that the chaotic matter of which this universe is composed, consists of the dissolved elements of a previous material universe, the question will still arise, Whence originated the matter composing *that* universe? And so we may extend our inquiries back through a thousand imagined pre-existent universes; but the mind must come to a resting-place *somewhere*. It is logically just as certain that there was a *first* universe (if we are mistaken in supposing that *this* is the first), as it is that there was a first vegetable form or class of forms, which latter proposition is positively demonstrated by facts in geology. And after we have gone back in imagination, to an absolutely *first* universe, the question will still

return unanswered, Whence originated the physical substance composing *that* universe?

As the line of progression traced backward necessarily leads to a *beginning* of the system of developments to which it applies, so the line of causation, inversely traced, necessarily leads to a *First Cause*, which is itself *uncaused*, though containing in itself the elements of all causes, and hence all existences. And as the whole Animal Kingdom, for example, necessarily rests upon the basis of a prior and immediately correlated and correspondent Kingdom—the Kingdom of Vegetation—so the whole Kingdom of *universal materiality*, so to speak, as necessarily rests upon the basis of a prior and immediately correlated and correspondent Kingdom. This Kingdom, then, must be *ultra-physical*, in the same way as the Vegetable Kingdom is *ultra-animal*; and it must differ in nature and constitution from the whole Kingdom of physical substance, at least as much as the Vegetable Kingdom differs from the Animal, or as the impelling and moving essence of the human mind differs from the impelled and moved essence of the human body.

Now, unless we suppose this *ultra-physical* (and hence *unphysical*) Kingdom to be a Kingdom of *Spirituality*, there is no conceptive power corresponding to it in the human mind, and hence it is to the human mind a *nothing*, and can not even be an object of thought, much less of faith.

But it may be asked, "Whence originated this Kingdom of *Spirituality*, which it is here alleged must have served as the basis of physical creation?" If we should answer that it originated in a higher and ulterior spirituality, and that *that* originated in a still higher, and *that* in a still higher; and if we could thus prolong our thoughts to an absolute eternity and in search of the Origin of origins, we would still have only

spirituality—an INFINITE REALM of Spirituality, beyond the idea of which our thoughts could not possibly go. We may set it down, then, as a conclusion which all analogy affirms, and which there is no conceivable reason to doubt, that this whole realm of Materiality, originated in this prior and correspondent Realm of SPIRITUALITY.

Now, spirituality, in its interior nature, possesses the properties of *affection*, *thought*, and *volition*, and these, again, are the attributes of *personality*. This ultimate, and hence infinite, Realm of Spirituality, therefore, involves the idea which we mean to convey by the term God: and the infinite series of *degrees* of spirituality of which the mind has just conceived in its search after the Origin of origins, may be supposed to correspond to the infinite series of degrees of the harmonious faculties of the one Infinite God, as these may be supposed to be represented in their ascending scale, from the most exterior portion of the Divine nature which connects with Materiality, to the most interior portions of the Divine Soul, which projects, generates, and vitalizes all things.

In saying, therefore, that the whole Kingdom of Physical Substance as such, originated in a prior and corresponding Kingdom of Spirituality, we, in effect, say that it originated in a Source possessing affection, intelligence, volition, and hence *personality*—in a Being, who, without any restraint or constraint from outer and physical influences (which did not then exist), could freely create, or abstain from creating, according to the internal promptings of his own Infinite Mind.

But let me not be understood as arguing that the matter of this universe was created by God out of *nothing*. The mind can not conceive of any such thing as nothing, or of something coming out of nothing; and therefore the idea may be at once dismissed from the mind as being itself a mental *nothing*. But

if we suppose that spirit is an *essence*, and that matter, as such, was created out of this essence, there will at least in this be no violation of the laws of thought; and the reasons on which such suppositions may be grounded will incidentally and more distinctly appear as we proceed.

There is a philosophy extant which insists that matter has *of itself* an *inherent* power of *motion*, and that matter (or physical substance) is *eternal*. But that this assumption is untenable, is obvious from the following considerations: Motion in matter, as shown before, necessarily tends to bring matter into *forms*; and if motion was from eternity in eternal matter, then matter must from eternity have been brought into forms—nay, into the *ultimate* and *highest* forms which that motion is qualified to engender. But as it is sensibly certain that these highest forms did not exist forever, and rationally certain that they must have ultimately sprung from a state of primeval chaos, it follows, of necessity, that motion in matter could not have been from eternity.

Moreover, if motion is an inherent property of matter, that motion must be the result of a *force* adequate to produce it; and that force must be either *mechanical* or *chemical*. But that matter contains of itself, and in itself, no *mechanical* force, is self-evident. Conceive of any body of matter, whether an atom or a world, being in a state of perfect rest: it is evident that that body has within itself no mechanical force adequate to move *itself*, much less to act upon kindred bodies. It is clear, therefore, that matter has within itself, and originally of itself, no mechanical force adequate to produce motion in any case; and, therefore, if a body at rest is not acted upon by an extraneous moving force, it will necessarily remain, for aught *mechanical* forces can do, in precisely the same place, and will possess precisely the same bulk and constituents, to

all eternity. This self-evident and generally recognized property of matter is called its *inertia*.

It is not denied that a *chemical* power—a power of expansion and condensation, or of altering the internal arrangements of particles—may be lodged in bodies of matter; *but this power is only the striving of particles for an equilibrium*. But unless there is a constantly active influence received from a *foreign* source, *the equilibrium must necessarily be finally attained*, and all action would then cease, never to be renewed by any inherent force, simply because such force is exhausted.

If we then consider the whole universal mass of physical substance, as the mass of particles supposed to be subject to this internal chemical action, that action, and its producing force, could not be eternal and unoriginated, because in that case it would manifestly, from eternity, have attained to an internal equilibrium, and all action would have ceased. These considerations show that even chemical action, and therefore chemical force, must have had a *beginning*, and therefore a *cause*, in some power or contriving agent *beyond* themselves, and outside of the matter in which they inhere.* But as there was no other realm of physical matter from which they could be supplied, we are driven to the only other alternative of supposing that they were supplied from a *Spiritual* Source—from the personal Realm of affection, intelligence, and volition, which we have before proved to be unoriginated, and hence *infinite*.

If this reasoning is correct, then the conclusion is obvious, that all motion of whatever kind, as well as the physical substance acted upon by it, must have had an ultimate origin in Spirit—IN GOD!

* It may be added, that chemical forces, as inherent properties of original, amorphous, nebulous matter, must have been exceedingly weak, if ~~in~~ such matter such inherent forces could have existed at all, which is extremely doubtful.

CHAPTER VI.

PRINCIPLES OF UNIVERSAL SYNTHESIS.

WE have now completed our *descending* view of the realm of Being without us, and traced the material creation to its super-material—hence spiritual—hence *Divine*, Cause. The completion of this general *analysis* unfolds to us the true basis of all *synthesis*; and, keeping in view the Spirituality, Self-existence, and Divinity of the Original Cause, we may now proceed to inquire, what may be known, or legitimately believed, in relation to the origin, *modus operandi*, and government of Matter and Motion, and of all the subsequently established creations, systems, and kingdoms now comprised in the general fabric of outer Being?

I am aware, however, that many will be likely to consider questions of this nature as too far above the sphere of the human intellect, to justify an attempt even at the most *general* solution. But let us not be discouraged. It was intimated in the outset of the present treatise, that *nothing exists in the realm of being WITHOUT man, which has not an antitype and correspondent in the realm of being WITHIN him*, and that all which exists without, and all which exists within, *possess toward each other the relations of cognizable objects and principles, and cognizing faculties*. Besides, we have already found reason to believe that Law is unvarying; and if so, it may be traced in its operations, not only *inversely* from ultimates to origins of creation's unfoldings, but also *directly*

from origins to ultimates. And as the wonderful powers of analogy have conducted us with apparent safety through the immense labyrinths of the stellar creations, in our efforts to trace them downward to their common source, we should not despair of deriving some substantial aid from the same mode of reasoning, when applied to the solution of those more profound and important questions which are embraced in a *synthetical* investigation of the system of Being.

As forming the basis of the process of investigation now to be pursued, we here lay it down, as a self-evident proposition, *that each and every effect is germinally contained in its cause, and hence, when developed, necessarily corresponds to its cause.* Were this not the case, neither cause nor effect could properly be called such, and there could be no conceivable sequential relation between the two.

For example, in the order of tangible developments by which man is surrounded, the Vegetable Kingdom precedes, and serves as the material source, of the Animal Kingdom. It therefore forms the *material* element of the cause of the Animal Kingdom, though a more essential element of the cause of this and all other creations, is of a *spiritual* character, supplied from a source that is *above* the particular creation to which it applies, as will be further illustrated hereafter. But the two kingdoms, sustaining toward each other, as they do, the relations of the material element of a cause, and the material element of an effect, stand, thus far, as mutual correspondents and exponents of each other. In like manner, the Vegetable Kingdom stands as a material correspondent and exponent of the Mineral Kingdom, which is *its* material source and cause, and contains the fundamental *principles* of its composition and physical properties, though in a *lower degree*. So the Mineral Kingdom, in like manner, has its physical corre-

spondent in the mass of amorphous planetary matter which served as *its* source; and so, by like gradations, the chain of analogy carries our minds backward through planetary nebulae, solar nebulae, etc., until we come to the one great, universal, undivided mass of chaotic matter, which must necessarily have contained within itself, undeveloped, the material elements of stellar systems, solar systems, planets, minerals, vegetables, animals, and even the physical elements of the human constitution. Though indefinite in the extreme, this, in its occult properties and adaptations, must, as a universal material Germ, have involved the physical correspondences of all the creations which subsequently sprang from it, in the same way as the acorn involves the physical correspondences of the future oak; and by an intelligence capable of perceiving its interior properties and adaptations, it might have been *predicted*, in a general way, what kind of creations were destined to spring from it.

But as the Animal Kingdom, physically speaking, was previously contained in the Vegetable, and the Vegetable Kingdom was contained in the Mineral, and so on throughout the descending scale, so the great original, universal Kingdom of unformed matter, and whose undeveloped properties and principles were typical of all subsequent and subordinate Kingdoms, was itself as *one* Kingdom, previously involved in the infinite, eternal, and unoriginated Kingdom of Spirituality, which, as before shown, constitutes the DIVINE PERSONALITY. This Kingdom of Spirituality—in other words, the Divine Personal Being—comprises, therefore, not only the material (or substantial), but the spiritual and volitional, and hence the entire elements of the Cause of all things in universal creation; and hence the Creator and the created must stand as mutual exponents of each other.

That the great Kingdom of universal matter, and what, for the sake of perspicuity, we have called the great Kingdom of universal Spirit, stand in relations to each other similar to (though more comprehensive and perfect than) the relations subsisting between any two conjoined subordinate kingdoms in nature, is an idea which it is desired the reader should distinctly comprehend, as it lies at the foundation of all true, material, and spiritual philosophy, and will, as it is believed, tend to entirely reclaim science from the general tendency which it has long apparently had, to Pantheism and Atheism.

Considering that matter, *as such*, originated in the creative efforts of Spirit, and hence *Mind*, there is another point of view, from which it will appear that matter, both in its primeval state, and in all its subsequent states of mundane forms, must necessarily have been in exact correspondence with its Source and producing Cause. We know something of the nature and operations of Mind, by experience and consciousness. We know that the mind of the architect, for instance, constructs an edifice within itself, or within its own conceptions and thoughts—constructs it as an *invisible* and *spiritual* edifice—before proceeding to give it a physical form in the outer world. After the building is *physically* erected, therefore, it stands as a precise image and correspondent of its archetype or conception which first existed in the mind.

Applying these principles to the subject under present investigation, we may consider the Divine Thought as the Architect, and the universe, or any of its systematically organized stages of development, as the Edifice. Not only, then, must the archetype of the universe in its maturity, with all its harmonious worlds and systems, but even the archetypes of

those atomic and infinitesimal forms constituting original chaotic matter, have distinctly pre-existed in the Divine, spiritual, and mental constitution.*

The Deity and the universe—the realm of Spirit and the realm of Matter—therefore, stand to each other in the relation of Archetype and Antitype—of Cause and Effect—and therefore the two, as before remarked, stand as mutual exponents of each other. In order, therefore, to arrive at some general conclusions in reference to the constitution and principles of creation as a whole, and also in respect to the constitution and principles of its included and correspondent sub-systems, let us first briefly interrogate Reason and Intuition in reference to some such general facts as we can comprehend, respecting the constitution of the Divine Being.

The only way in which we can obtain any definite and proper conception of the Divine Being, is by first conceiving of a true and undegenerated *human* being—such being the culminating point of all Divine creations, and hence the embodied representative of all the Divine affections. Although it is not the intention to base the propositions of this work on the authority of inspired writings (whatever *confirmations* of such writings may be *incidentally* developed in the course of our *philosophical* investigations), we can not, in this place, avoid noticing the biblical declaration that “God created man in his own image,” as impliedly sanctioning an endeavor on our part to understand all that we may comprehend of God, by a comparison of the knowledge we have of man. Spirit, indeed, is essentially of the same nature wherever found, whether existing in a finite or an infinite degree, though it is acknowledged

* The idea of *Archetypes*, as here presented, was originally conceived by Plato, and formed a prominent feature of his philosophy; though the author here derives it from sources independent of Plato's teachings.

that it may exist in different shades of moral character as resulting from different combinations, developments, and directions of the faculties. Conceive, then, of a *perfectly* constituted man—a man whose physical, intellectual, and moral natures are in harmonious development, and then conceive this man to be expanded to *infinitude*, and you have the truest and highest conception of God of which the human mind is capable.

But it would be diverting the reader too far from the object of this portion of our treatise, to enter at present into an elaborate discussion of the question, What is man? This question shall be discussed at length in the second part of this work. But for the present we must confine ourselves to a few propositions which, to intelligent minds, will appear more or less self-evident, and of the truth of which, as well as of the ulterior positions which they will serve to illustrate, confirmation will accumulate as we proceed, until any reasonable doubts with which some minds may at first regard them, will, it is believed, be either greatly diminished or entirely dissipated.

Let it be apprehended, then, that the *most general* constituents of human personality, are three; viz., 1. Soul, or interior vitality, which is the seat of the affections; 2. Spirit, or the organized, pervading nerve-element, which, in its lower degrees, is the vehicle of sensation, and in its higher degrees, is the seat of the understanding; and 3. Body, or vehicle of outer manifestation and action.

Precisely corresponding to these are the three most comprehensive constituents of the *Divine* Being; viz., 1. Interior Soul, Life, or *Love*; 2. Spirit or Wisdom; 3. Outer sphere or vehicle of operative Energy, the latter corresponding to the *body in man*.

But the constituents, both of the human and Divine personality, considered in more detailed reference to elements, forms, and outer objectivities, are also, in each case, susceptible of a *seven-fold* division, which may be briefly stated as follows: 1. Subjective Love, or Love as an abstract quality of the personal essence; 2. Subjective Wisdom, or Wisdom as an abstract quality of the personal essence; 3. Subjective volition, or volition as an abstract power of the two previous elements combined, and a procedure from them both; 4. The essences having the properties of Love, Wisdom, and Volition, embodied in *personal organism*; 5. Objective Love, or Love as related to outer forms; 6. Objective Wisdom, or Wisdom as related to outer forms; 7. Habitation, or a complete system of outer objects and conditions related to the whole personal nature and desires, and in which such nature and desires become embodied and represented.

In man the elements of this seven-fold classification contain within themselves many corresponding sub-divisions, some of which are much more obvious than the foregoing general divisions, as will be seen when, in the course of our inquiries respecting the Microcosm or the universe within, it comes in order to discuss them. In God the elements of this seven-fold division may be presumed to contain an *infinite* number of sub-divisions, all of which are, in like manner, susceptible of corresponding seven-fold classifications; and their co-relations and inter-communications may be supposed to constitute the infinite harmonies and beatitudes of the Divine soul! Our object at this stage of our treatise, however, is little more than to unfold the *idea* of these classifications as a basis on which the great plan-work of creation may be conceived, leaving such evidences of their truthfulness as exist in the nature of things to be incidentally developed as we proceed.

This seven-fold classification of the principles of the Divine constitution, is probably what the inspired seer St. John had reference to when he spoke of the "seven Spirits of God which go out into all the earth." And it was undoubtedly the out-goings and efficient operations of these which produced the various seven-fold Divine antitypes which were shown to the same inspired seer under the forms of the seven churches of Asia Minor; the Lamb with seven horns and seven eyes; the book with seven seals, and their successive openings at seven different epochs; the seven angels with seven trumpets; the seven thunders; the seven last plagues, etc.*

If it be true, then, that there are these seven natural divisions in the constituents of the one Divine Being, it is obvious that any system of creation or operation which presents a complete reflex of what is contained in the Divine Source from which it sprang, must contain a representation and outer expression of *each one* of these Divine constituents, and must therefore, as a whole, be also *seven-fold*.

But we have seen that Nature, as a Whole, is divided into many Systems, Kingdoms, or more properly speaking, *Discreet Degrees*, rising one above another. *Each one* of these Kingdoms or Degrees (as will gradually be illustrated in what follows) contains within itself the seven-fold series of parts, as the natural evolution, and reproduction, on a higher scale,

* The number *seven* appears to have been anciently recognized as a general number of *completeness*, and as such it appears to have been habitually employed by the sacred writers. Thus, in their classifications, there were seven days (or periods) of creation; seven days of the week; seven years from one sabbatic year to another; seven times seven years from one jubilee to another, etc., (see by the aid of the concordance, the numerous instances in which the number seven occurs in the Old and New Testaments). Some of the ancient heathen nations, also, adopted the seven-fold classification as of extensive application, especially to spiritual and Divine things; and it was introduced by Pythagoras from India into Greece.

of the seven-fold series of the Degree or Kingdom immediately below it in the order of development; and all of these, separately and collectively, are evolutions from, and correspondents of, the Divine seven-fold Constitution, which is the Originator and Cause of all. Each one of these seven-fold series, moreover, corresponds to the diatonic scale in music, and which, with its seven constituent notes, is therefore its natural oral interpreter and exponent. Thus the various Degrees or Kingdoms of natural developments, may be considered as *octaves*, rising one above another, the same as the octaves in music. *Each octave exactly corresponds to, and harmonizes, note by note, with all other octaves, whether they be on a higher or lower scale; so that if we fully understand any octave, Degree, or Kingdom of natural development, we have in it a measure and exponent of all others.* Thus the system of nature, as a Whole, may be considered as one grand Musical Organ, compassing all these octaves, and which, in the hands of the Great Organist, the Divine Being, in whose infinite series of octaves of Love and Wisdom, exists the very soul and origin of *all* harmony, is capable of sending forth every where those silent notes of harmony and music which have been perceived and deeply felt, by every truly elevated and interiorly developed human soul!

The idea of the "music of the spheres," therefore, is not merely a poetic fancy, but a sublime reality, whose basis and origin are exhibited in the foregoing simple principles.

That this harmonial scale of creation, as corresponding to the harmonial scale of degrees of Love and Wisdom of the Divine Mind, is not a mere fanciful conception, will become more and more obvious as we proceed. It will be shown, that not only does each one of these degrees or octaves of

creation, by its correspondence with all others, serve as their natural exponent, but that each octave, if its constituents are correctly classified, rests upon internal evidence of its own. And if this serial order of graduated progression is duly recognized, and its laws are properly understood, we may use any seven-fold classification, *known* to be correct, in correcting the errors of others, just as the musician would correct the discords of one octave by the harmonies of another.

But before proceeding further, we must speak briefly of the *laws* which, as we proceed, will be seen to govern the septenary classifications, and by which it may be generally known whether any classification is correct. In each correct classification, the members, in their numerical order, may, in *general terms*, be distinguished as follows:

Number ONE is the number of *simple* unity.

Two is the number of *productive* unity, and in general terms comprises positive and negative, active and passive, or male and female, principles.

THREE is the number of *self-sustaining* unity.

FOUR is the number of *Organization*.

FIVE is the number of *exterior* completeness. There being five *exterior* properties to outer things, man, hence, has five *exterior* senses, whose object is to give information of them to the interior soul. As the five *exterior* properties also exist, with *express reference* to two *interior* and *higher* properties, the number five is also a number of *aspiration*, as will be better understood hereafter.

SIX is the number of subordinal association, and of harmonial, peripheral revolution, as around a governing center.

SEVEN is the number of final completeness, embracing both

exteriors and interiors. Hence it is the pivotal and governing number of the series.*

This septenary classification may also be embodied in the *triad*. Thus the first, second, and third members of any seven-fold series, form one trinity, and therefore may count as a unit; the fourth, fifth, and sixth members form a second trinity, and count another unit; while the *seventh* member, which is always equal, or rather superior, to all the rest put together, forms a third unit, and completes a *general* trinity. As a guide to correctness in any septenary classification, it is important to observe that the first and second trinities in the series, should bear a certain general and particular *correspondence* with each other.

Whatever obscurities may at first exist in the foregoing statement, will be abundantly clarified by the illustrative examples which will incidentally occur as we proceed. It is here given mainly as a hint to the reader, that the classifications in which we shall have to deal, are not *arbitrary*, but founded in the nature of things. Considering, therefore, that each natural seven-fold series corresponds to, and illustrates every other, and that this septenary arrangement runs through every complete creation, system, and Kingdom in nature, the degree of reliance which may be placed on the legitimate results of the method of investigation now proposed, as well as the character and extent of those results, as compared with what may be obtained by other processes, may be illustrated as follows: Suppose there are a large number of timbers, hewn, squared, morticed, etc., and piled confusedly together.

* The ancient inspired records deal largely in the number *twelve* and its multiples, as an interiorly significant number. It may be remarked that the number *twelve* is evolved from the seven-fold series, and is simply the number of six productive unities, or positive and negative, active and passive, or male and female, principles. It is therefore, also, a number of subordinal association.

The superficial observer, uninstructed in the synthetical principles of architecture, may take most accurate measurements of each of those timbers, and may give most correct descriptions of their shapes, abstract qualities, etc., just as science, as ordinarily pursued, gives accurate descriptions of abstract facts which constitute the timbers of the great temple of Nature. Such an observer, however, may not be able to discover any intended *connection* between many of those timbers; may be able to form little or no idea of the form, proportions, or correlative parts of the building which they would constitute, if all put together, and may even doubt that they were ever all intended to go together in any definite form; and that science which merely *analyzes*, but does not *synthesyze*, experiences much the same difficulty in viewing the timbers of the temple of Nature. But suppose, now, that a skillful architect comes on the ground: he views those apparently heterogeneous timbers, not only analytically (or in isolated detail), but also synthetically, or in their relations to each other; and, by the observance of simple rules, he proceeds—without any paring or forcing—perhaps without even the “noise of the hammer”—to erect a magnificent and glorious temple, in which there is a place for every timber, from greatest to smallest, and a timber for every place which requires one. Then even the previous superficial and merely *analytical* observer of the timbers will *know*, if he surveys the edifice, that those timbers were intended to go together precisely in the relations in which he now finds them; and that the rule or theory by which they are brought together, is *true*.

Suppose the observer noticed, however, that in the erection of the building, some of the timbers were a little pared, or forced, or warped, in order to make them join with

others: still, if the building, when erected, exhibits unmistakable indications of order, and symmetry, and harmony of its numerous parts, it stands as evidence of *general* truthfulness of the architectural rules by which it was erected; and, if it is then known that the hewer of those timbers was *absolutely perfect* in his art, the inference would be legitimate, that the paring and distortion used in putting them together, were owing to the ignorance or unskillfulness on the part of the builder, by which a joist or a post was occasionally inverted, or made to take the intended place of another of somewhat similar form.

Now, all natural facts (which, it must be confessed, the science and philosophy of the day view in an aspect *somewhat* heterogeneous) are *timbers* of the great temple of Nature. A system of classification and reasoning, therefore, by which these various facts, as *timbers*, may be, without any warping or forcing, brought into the form of one grand system, among the myriads of the complicated parts of which there may be observed a mutual dependence and harmony so perfect, that the loss of a single part would sensibly mar the symmetry of the whole; then we may be assured that this system is the *true* one, and that the structure erected by it is a structure of truth. *Now, a system of classification of this kind must exist somewhere in nature, if it be admitted that nature is not, after all, a more or less heterogeneous and disconnected mass.* If the reader can not believe, with me, that the doctrine of the seven-fold series and its natural adjuncts, as herein briefly unfolded, constitutes that system, it is confidently believed that he will at least find it immensely suggestive, compelling nature, in many instances, to tell her own story, and to give up secrets which science and philosophy have hitherto been inadequate to wrest from

her grasp. For the several years which have elapsed since I was so fortunate as to be led to the discovery of this method of correspondential reasoning, I have pursued it with results which, to my own mind, at least, have been intensely satisfactory ; and, I confess, that without its aid I could not have had any conceptions which might have been regarded even as an approximation to a solution of many of the questions discussed in this work.

CHAPTER VII.

THE SEVEN FUNDAMENTAL LAWS, AND THEIR INTIMATIONS RESPECTING THE ORIGIN AND STRUCTURE OF THE UNIVERSE.

DEEMING the foregoing a sufficient exposition of the principles which shall guide us in our further inquiries, we now proceed to our proposed *synthetical* investigation of the system of being without us. Pursuing the natural order of progression, from fundamentals and generals to ultimates and particulars, we will first institute some comprehensive inquiries respecting the origin, structure, government, etc., of the physical universe as a whole; and afterward, similar inquiries shall be pursued in relation to the Solar System, the planet on which we dwell, and the various systems of inanimate and animate creation which exist upon its surface, of which the ultimate and highest is the human organization.

And, in view of the new method of reasoning which we have unfolded, let it be borne in mind that if the origin, constitution, laws, functional operations, etc., of *any one* of the systematic creations proposed for investigation, can be elucidated directly and more clearly than *any* other, it will serve as a correspondential guide to the further elucidation of all the others. Thus, with a proper classification of the corresponding series and degrees of nature's unfoldings and operations, the known will cast the whole light of its analogies upon the unknown—just as each timber of a temple hints the shape and nature of the timbers with which it is to be conjoined, &

thus serves as a guide to the erection of the edifice; or, as a single fossil bone of an extinct and previously unknown animal, enables the comparative anatomist to describe with accuracy, the animal as it lived and moved upon the earth in its organic completeness. Our method, if successfully pursued, will, moreover, develop the unity of principle pervading, in different degrees, all creations, from lowest to highest—the unity and harmony, therefore, of the one and only system of universal truth; and, as we pursue the revelations of the physical universe, from its rudiments to its higher unfoldings, our thoughts, from the accumulating analogies, will gain such an upward impetus as may hereafter carry them directly through the line of those higher and corresponding truths, which relate to man physiologically, psychologically, spiritually—socially, politically, and religiously.

With respect to the origin, structure, laws, etc., of the universal cosmical system, we commence our reasonings with a postulate which, whether strictly true or not, can not lead us into important error in our subsequent deductions, since we have so many correctives of inharmony, as involved in the general series of corresponding and harmonious octaves of developments through which the path of our investigations will lead us. The postulate is, That God, from the promptings of his own interior soul, which is Love, under the direction of his Wisdom, which gave order and form to the operations of Love, formed from the most exterior, or, if the expression may be allowed, the least Divine and most nearly physical, portion of his own personal emanations, as many degrees, varieties, or perhaps classes of atomic particles, as corresponded to the general seven-fold harmonies of his own Infinite nature. The supposition that the varieties of these primitive atoms are, in number, just seven, or a multiple of

seven, is admitted to be purely *a priori*, but is a legitimate deduction from principles before established: it is here offered as an introduction to propositions more certain, and from which it, in its turn, will receive confirmation; though, if it could be proved to be untrue, it would not essentially affect our main argument. These varieties of atoms, then (*whatever* their number may have been), may be supposed to have constituted Matter in its primitive state, which probably was characterized by none of the distinctive properties of oxygen, hydrogen, nitrogen, calcium, potassium, or any others of the so-called "elements" known to chemistry. In being evolved, in particleized form, from the emanated personal Essence of the Divine Being, the substance thus particleized ceased to constitute any necessary portion of the Divine Person, and formed a Realm or degree of Being by itself, but still a Realm of Being *corresponding to, immediately connected with, and capable of receiving direct influx of vital energy from, the great Personal Realm of Spirit from which it proceeded.* This vital influx, however, may be supposed to have been altogether *optional* on the part of the great Generative Spirit, even as was the evolution and particleization of essence itself; and, without the direct communication to it, of an impelling energy from the Divine source of all energy, matter, thus constituted, would, as before shown, have forever remained inert.

We are next, therefore to inquire into the origin and laws of *MOTION* in this primeval chaotic mass.

Admitting, what was before proved, that *inertia* is an inseparable property of matter left solely to *itself*, it is self-evident that *Motion* could have been the product only of a *Force* adequate to overcome the tendency of matter to remain fixed. Though force is essentially of the same general nature

in whatsoever direction it may act, there are several modifications of the dynamic agents in which force originates. These, requiring, as they do, a separate chapter for their proper elucidation, shall only receive such allusions in this place as will be necessary to the explication of the *laws* by which force acts in producing motion, aggregation, segregation, reciprocal transference, and structural stability.

It has before been repeatedly remarked, that the universe without corresponds to the universe within man, and that therefore all principles and developments of the outer universe may be conceived of by the fully unfolded human faculties. This is because man is, physically and spiritually, an *epitome* of all previous Divine unfoldings, and therefore is a *microcosm* or little universe of himself. Though it is proposed to consider the discreet degrees of creation in their natural order of unfolding, tracing each octave as it passes upward and merges into a higher and corresponding one, until the whole merge (loosely speaking) into man; yet, for the purpose of illustrating the forces and laws of the physical universe by the same forces and laws which, in an ultimately sublimated degree, apply to man, we will here so far anticipate the appropriate subject of the second part of this work, as to exhibit the following self-evident truths respecting the human economy.

In man (the microcosm or little universe) there is, 1. *Passion* or Love, which corresponds to *Heat*; 2. *Intelligence* or Wisdom, which corresponds to light; 3. *Nerve-essence*, which corresponds to electricity (these three forming a *trinity*); 4. The agent which attracts circulating particles, and deposits them in the solid portions of the organism; 5. The agent which removes particles from lower tissues, and deposits them in higher; 6. The agent which acts and re-acts sympathetically between one organ and another (these three forming a second

and corresponding trinity of dynamic agents); and, 7. The interior, unitizing, and vital agent, which pervades and governs all the preceding.

Accompanying, and precisely answering to, these seven dynamic agents in man, are *seven laws*, or *modes*, by which the former operate. These are, 1. *Expansion*, governing all diastolic movements; 2. *Contraction*, governing all systolic movements; 3. *Circulation*, governing all rudimentally reciprocating movements (first trinity); 4. *Aggregation*, governing all depositing and organizing operations; 5. *Segregation*, governing all ascending movements; 6. The law governing all *sympathetic* movements (second trinity); 7. The law of all vital, unitizing, and governing operations, the vital and spiritual constitution as a whole being here the mover.

Now, in the macracosm, or great universe, we have, 1. Heat, which corresponds to Passion or Love; 2. Light, which corresponds to Intelligence or Wisdom; and 3. Electricity, which corresponds to nerve-essence, in the *little* universe—these forming a fundamental trinity of dynamic agents as operative in outer nature. There is also a second and corresponding trinity of dynamic agents in nature, and also a seventh and vitalizing agent, as corresponding to the same in man; but these important agents shall be illustrated hereafter.

Assuming their existence for the present, however, we may remark, that, corresponding to these seven dynamic agents, there are also *seven laws* which govern the outer universe, and all its correspondent sub-creations, whether in the animate or inanimate departments of being. These laws, indeed, are the same throughout with those which we have seen to apply to man, though in lower creations they exist in lower degrees of development. They may be exhibited, with their ternary relations, in the following table:

PRIMARY TRINITY.

1. Expansion.
2. Contraction or Attraction.
3. Circulation.

SECONDARY TRINITY.

4. Aggregation.
5. Segregation.
6. Sympathetic reciprocation.

7. Vital complex unity.

Here, it will be perceived, is a regularly graduated progression in the order of elements, ascending from first to last, as it were, through the different stratifications of one complete system. They maintain relations to each other similar to the relations of the different parts of a tree; viz., the first is the root of the series; the second is the trunk; the third is the branches; the fourth the leaves, and the completion of the organic form of the tree (wherefore, No 4. in any seven-fold series, always corresponds to aggregation, organization, or association); No. 5 commences the segregative or reproductive process, and corresponds to the flower buds; No. 6 corresponds to the flowers, and No. 7 always corresponds to the fruit, embodying in itself the sublimated elements of the whole tree, together with the seed or germ of a future and corresponding creation.

The first trinity in the series approximately corresponds to the second, but the correspondence is rather by way of counterpart, or *antithesis*, than in any other way which may be easily defined; and in the general trinity, comprehending the whole septinity, may be observed a *general* correspondence with the sub-trinities.*

These, let it be borne in mind, are claimed simply as the *fundamental* and *all-comprehensive* laws of natural and moral

* These *general principles* of classification, not only in respect to dynamic agents and laws, but their corresponding forms and developments, are applicable to all natural series or octaves, and by duly comprehending and observing them, with the peculiar and relative characteristics of their parts, we may be able always to distinguish true from false classifications.

existence, saying nothing of those numerous *sub*-modes of operation, commonly called laws, which grow out of them. The essential principles of these general laws, in their simple and combined states, and in their various degrees of sublimation and ascension, as applicable to the different degrees of creation, will, we apprehend, be found to involve a sufficient explanation of every mode in which original Divine Force operates in the production of the various phenomena of creation.

Considering, then, that the primeval chaotic materials, out of which the universe was formed, did not originally, and of themselves, possess any force or motion, we proceed, in the light of the foregoing principles, to inquire more particularly Whence, and how, originated the forces, laws, and motions from whose diversified operations has resulted the stupendous system of being by which we are surrounded, and of which we are a part?—and what was the order of progressive development, and what is the general structural form of the cosmical universe, which must have legitimately resulted from these causes? And, as it has been before shown that all the *principles* that are involved in the *infinite*, may be epitomized in the *infinitesimal*, we may, for the sake of convenience, and without injury to the argument, reduce the subject of our contemplations to an imaginary scale of magnitude which may easily be conceived by the human mind, and which will allow of all progressive operations being surveyed as from a single stand-point.

The influence which may most naturally be conceived to have first acted upon primordial matter to impel it to ascending developments, was Divine Love. Now, Divine Love corresponds to *Heat*—is, indeed, spiritual heat itself, and thus is the first *expansive* impulse of mind. It is so in man, as well as in

the Deity ; and its correspondence with physical heat is instinctively recognized by the human mind, and is implied in the phraseology with which men naturally speak of it. Thus we speak of one in whom the love or passion principle predominates, as a "*warm*-hearted man," as an "*ardent* enthusiast," or as a man of "*fiery* disposition." On the principle, therefore, that all bodies are developments from an interior soul, and all natural phenomena have an ultimate spiritual origin, we may conceive that while the great Kingdom of Matter was in such immediate relation and juxtaposition to the great Kingdom of Spirit, its Cause, Divine Love (or Divine Spiritual Heat) flowed directly into the Realm of Matter, and especially into its seventh or highest and proximately vital degree as being most in affinity with the Divine Spirit itself, and that the effect of this influx was an immediate generation of a corresponding *natural* heat.* This heat must necessarily have been attended by an immediate *expansion* of the recipient particle or collection of particles, and by the evolution of a magnetic or *magnetoid* atmosphere partaking of the nature of the particle's interior vitality. Divine Wisdom (or spiritual light) entering with, and acting through, the Love, pervades this atmosphere, and brings it into the nature of *physical* light, to which wisdom corresponds.†

The expansion resulting from the heat must necessarily have

* That *natural* heat may be produced by what we have here termed *spiritual* heat, is shown by the fact, that when passion flows from the interior soul into the nervous tissues of the human body, it raises the general temperature of the body, quickens the circulations, produces a flush of the countenance, and a burning of the cheeks, and, in general, greatly increases the physical powers. It may be remarked, that the general principles of this portion of our theory were taught by the celebrated Swedenborg, though we have arrived at them by an independent process of induction.

† It is well known that natural light consists of *seven* prismatic rays ; and this fact hints at the corresponding *seven-fold* nature of Divine Wisdom, and hence, also, of Divine Love, its inseparable associate.

produced a comparative vacuum—that is, a vacuum in respect to those essences which were subjected to the expansion, and therefore produced a tendency to an absorption or rushing in of corresponding essences composing neighboring particles, and which had not yet, in the same degree, been acted upon by the expansive force. Moreover, the active light-sphere (or Wisdom-principle) which is an orderly procedure from Heat, (or Love), or accompaniment of, and the administration to, its wants, formed a recognizing and sympathetic connection between the particle first acted upon and the particle immediately conterminous; and by an envelopment of the relatively passive particle in the light-sphere of the relatively active one, the former would become assimilated to the latter, and, floating to it through the circulating currents of the enveloping light-sphere, in the same way that the particle of iron floats to the magnet through currents of the magnetic essence, it would become incorporated with it as a part of the same body. Thus, as each particle is made the recipient of the essence of Divine Love, it lovingly opens its heart, and extends its ethereal arms to receive and embrace its brother, and the two thus become one. And being thus united, and becoming recipients for a further influx of heat, the same operation that before took place, is now repeated on a little larger scale, and more particles are attracted. And so the process continues to be repeated, until the minute nucleus of a CENTRAL SUN is fully established, which, by a continuation of the same process of unfolding, goes on to complete development, forming the whole universal mass of physical substance into one coherent and undivided Body, dense in the center, and gradually shading off into extreme levity toward the circumference.

If, instead of supposing this operation to commence in in-

infinitesimal particles, we suppose it to commence in a few cubic feet, or in hundreds, or thousands, or millions of cubic miles of central matter, or if we suppose (what is probably more nearly the truth) that all particles in the universal mass were simultaneously vitalized, *but in different degrees*, by the influx of Divine spiritual heat, and that each commenced forthwith, a tendency toward particles more vitalized than themselves, and all a tendency toward the particle *most* vitalized, the *principle* involved will be the same, and the ultimate result of the operation will be the same.

If the foregoing theory of the initial steps of the creative process is true, it not only affords us an example of the incipient operations, but an illustration of the very *cause* of gravitation, of which latter I believe no adequate explanation has yet been afforded by any of the common philosophies of the day. There are, however, in subsequent stages of the creative unfolding, higher elements and forces which enter into, modify, and render more definite, the phenomenon of gravitation, as will be seen.

The manner in which two streams of particles flowing from *opposite directions* toward a common center, tend to produce a *rotatory motion* in any collection of central particles, has been explained by those who have written on the nebular theory of the origin of worlds and their motions.* The idea may be apprehended from the following illustration: Suppose that two balls of equal weight, are rolled with equal velocity, over the floor from opposite sides of a room, and that they at the same instant impinge upon a third ball lying at rest in the center of the floor. If the two strike the ball at rest in a line exactly cutting its center, no motion will be generated in the

* See particularly Nichol's "Architecture of the Heavens."

It is easy to conceive that the annular masses, being not only internally active, but penetrated in various directions by the refracted emanations from the central sun, would be liable to be rarefied at particular points and condensed at others, and thus to be shrunken and cleft apart, at particular lines and angles, and that by inherent action of the particles of the rings themselves, contraction would take place from these lines of cleavage, and that the materials previously united, would thus be segregated into separate masses. These masses would, on the same principle, be liable to be subdivided into inferior masses of greater or less number, in proportion to their respective original magnitudes. This whole process of segregation or fragmentation, is *faintly* illustrated by the breaking up of the clouds after a storm, and their resolution into separate masses.

According to principles before explained, each general mass, owing to its particles gravitating to a common center within itself, would assume a general rotatory motion which, for reasons which mathematicians will readily conceive, would necessarily conform in its direction to the revolution of the great ring of mundane materials to which it belonged, and each sub-mass would have a particular rotating motion of its own, which would conform to the motion of the general mass to which it belonged, *i. e.*, supposing that there were not in either case any *particular* or *incidental* causes of disturbance. Thus general masses and their included *sub*-masses, with their general and particular centers of gravitation and revolution, would, by further progression, form general stellar systems, and their included sub-systems, and finally, also, systems of planets and satellites, all of which latter would be evolved by the progressive unfoldings of the same principles heretofore explained as governing the formation of the *universal* structure.

In this way, therefore, as may be rationally supposed, originated all the nebulae, clusters, stellar systems, or firmaments, which the telescope has revealed, together with untold millions of others of like nature, which lie forever concealed from mortal vision! In other words, each one of these originated from a fragment of the periphery of a great wheel or circle of nebulous materials, surrounding the great Center of all centers.

This hypothesis, relative to the origin of the stellar clusters, is not without strong confirmatory evidence in celestial appearances. I have suggested that the vivifying emanations from the central sun, acting upon the angular masses of nebulous matter, would produce planes of rarefaction and cleavage in various directions, from which planes each resultant insulated mass, as also each of its subordinate and included masses, would contract upon its own center. It is evident, therefore, that each general mass, with its included sub-masses, would first be of an *angular* form—on the same principle on which any cooling and contracting substance tends to separate into angular masses, and as is sometimes exemplified in the cleavages of igneous rocks. But, by the force of internal gravity, and the rotatory motion which, according to principles before explained, would naturally result therefrom, these nebulous masses would all tend, as they progressed, to assume the *elliptical* or *spherical* form. Now, this is precisely what is observed in relation to the nebulous and stellar masses of space. Some are of exceedingly irregular form, having long and sharp projections from their sides, and are of irregularly alternating degrees of density in their centers, as though they had, by variously intersecting forces, been subdivided into numerous inferior compartments. Commencing at these extreme irregularities, there are all

intermediate degrees of symmetry in shape, down to the perfectly globular shape, to which the prevailing forms of these stellar masses manifest more or less approximation. Judging from appearances, therefore, one would say that these masses are evidently in all degrees of progression, between rudimental and ultimate forms, and that, in general, those of the most angular forms are the *least*, while those of the globular form are the *most*, progressed.* This is all manifestly in exact harmony with the hypothesis of nebular and angular segregation, and subsequent firmamental, solar, and planetary conglobation, which we have proposed.

Moreover, these nebular or stellar masses, although they appear in all directions in the heavens, are said to appear, as already intimated, in greatest abundance in the direction of a particular plane, which cuts the plane of our Milky Way at right angles. In the direction, *perpendicular* to this plane, they grow comparatively thin (as do the *stars* in the direction

* In illustration of the progression from angularity and ellipticity to sphericity in these bodies, I may quote the following from the splendid work of Sir John Herschel, embodying the results of his observations at the Cape of Good Hope. With reference to the engraved figures of two particular nebulae existing in the southern heavens, he says: "These figures exhibit elliptical nebulae, normal in their character—that is to say, in which, as the condensation increases toward the middle, the ellipticity of the strata diminishes, or in which the interior and denser portions are obviously more nearly spherical than the exterior and rarer. A great number of such nebulae, of every variety of ellipticity and central condensation, are figured in my northern catalogue. Regarding the spherical as only a particular case of the elliptic form, and a stellar nucleus as only the extreme stage of condensation, at least nine-tenths of the whole nebulous contents of the heavens will be found to belong to this class; so that, as regards a law and a structure, the induction which refers them, as a class, to the operation of similar causes, and assumes the prevalence within them, of similar dynamical conditions, is most full and satisfactory. To abstain altogether from speculation as to what may be the nature of those causes and conditions, and to refuse all attempts to reconcile the phenomena of so large and so definite a class of coemical existences, with mechanical laws, taken in their most general acceptation, would be to err on the side of excessive caution and philosophical timidity."—HERSCHEL'S *Results at the Cape of Good Hope*, p. 22.

perpendicular to the plane of the Milky Way), suggesting the idea of a very remote approximation to the horizontal boundary of the stratum. Though it is a thought bordering on the confines of the human conceptive powers, and thus penetrating somewhat into the realms of uncertainty and doubt, it may still be propounded as a query—Whether the plane of this grand stratum of sub-universes, may not indicate the *direction* of the plane of the great Ring of original nebulous materials, from which these nebulae and stellar systems become segregated and resolved into their present forms, and whether all firmamental creations, revealed by the telescope, may not thus be included within a comparatively small fraction of a segment of *one* of the great cosmical rings which surround the Center of all centers? Though a question so profound can probably never be finally decided by the human intellect, the indication of this grand plane of cosmical formations, tends, so far as it bears upon the subject, to confirm our hypothesis, that all visible nebulae and stellar systems, are segregations from one general mass of nebulous matter, originally existing on one general plane; and the analogies of all known definite motions and formations in the stellar spaces, point to the idea of a *circular* or elliptical form as characterizing this grand plane of creations.

While this theory gives definite form and order to the subject of our contemplations, it opens the mind to the most sublime conceptions of magnitudes and distances. Herschel estimated that his great telescope would reveal the existence of a star so far removed into space that light, traveling at the rate of twelve millions of miles in a minute, would require three thousand five hundred and forty-one years to pass from that star to our earth. Such, therefore, may be supposed to be the approximate distance of the remotest of those luminous

masses which were resolvable into stars by his telescope. He, however, computed that his large telescope would follow one of those large clusters, as a *general* mass, if plunged so deep into space that its light would require three hundred and fifty thousand years to reach us; and, it is thought that the great telescope of Lord Ross would pursue the same object to ten times that distance, or a distance which light, with its inconceivable velocity of motion, would consume more than three millions of years in traversing!* This, therefore, may be assumed as the proximate distance of the *remotest* nebulae rendered visible by Lord Ross's instrument. If, as is probable, all stellar creations, included in a sphere bounded on all sides by this enormous distance, constitute only a small fraction of a segment of one such circle of creations as we have supposed to surround the great common Center of attraction, it would not be advisable for the reader to attempt to conceive of the dimensions even of *one* of those *whole* circles, much less of the *whole universe*; which latter, however, if *created*, must be inferior to the Creator, and thus *finite*.

But, applying the same *general* laws to the creation of the solar, and the creation of the *universal*, system, it may be asked, "Why is it that either the unitary agglomeration represented by single planets, or the multiplied segregated division which we have supposed to be represented by nebulae and stellar clusters, did not take place uniformly in *both* systems as the formation from the materials of the nebulous rings?" The answer, I apprehend, may be found in the different *conditions* of the rings in the two systems, as involved in their different magnitudes. In the great system of systems, the dis-

* See Mitchell's "Planetary and Stellar World," p. 266-7.

tance of particles at any two extremes, must have been so great as to prevent them from having any *appreciable* attraction for each other. *Some* tendency to draw together and form a single permanent mass, indeed there must have been; but this tendency at the more distant points in the mass, must have been so small, and the activity of particular districts, especially after incipient nucleation, must have been so great, and so rapidly increasing, as to give rise to subsequent and numerous mundane forms and systems—the very thing proposed in our theory of segregation, and confirmed by appearances in the heavens.

But in the solar system, the distance from one extreme of the annular formation to the other, was comparatively small; and besides this, we may suppose that the varieties of matter in so small a mass, were less extreme, and that their affinities were more intimate, than in the universal mass previously spoken of. There was, therefore, not only a possibility, but a high degree of probability, that the materials of each of the rings of nebulous matter formed around our sun, would assume the form of *one* mass, which would subsequently move in an orbit whose plane and distance would be coincident with the previous ring.

But, admitting the nebular hypothesis, the multiplied segregative process actually does seem to have taken place in one instance even in our solar system, and given rise to *several* planetary bodies as the products of *one* ring. It is scarcely necessary to say that we refer to those strange bodies called the asteroids, which revolve at almost equal distances from the sun, between the orbits of Mars and Jupiter, and of which there is now known to be fifteen or sixteen in number. That these bodies must have originated from one primitive mass of planetary matter, there can be but little doubt, as such an

hypothesis is necessary to preserve the uniformity of the system, and, to supply the vacuity that would otherwise have existed between the orbits of Mars and Jupiter.

If, therefore, instead of being without progeny, and revolving in solitude (which can only be owing to their diminutiveness), each asteroid were attended by a numerous family of children and grand-children (or satellites and sub-satellites), and revolved around one of their number, while performing their general circuit around a superior center, they would exactly illustrate, on a small scale, our idea of the segregated stellar clusters of the universe—each of which latter may be supposed to revolve, as one general body, like the asteroids, in an orbit generally coinciding as to plane, and distance from the great and common Center, with the plane and distance of the great ring of nebulous materials in which it had its parentage.

But it should be understood, that the *fifth* stage in the process of creation, considered merely as a process of *segregation*, is complete with the formation simply of separate angular masses and sub-masses, from the general materials of the nebulous rings.

The *sixth* process in the creative procedure, is a process of *solarization*, or one by which these previously segregated and indefinitely formed masses and their sub-divisions, become established *suns*. This process is accomplished by gravitations to, and emanations from, central points in the segregated masses, on principles essentially the same with those previously explained as applying to the formation of the first great central Body; but in this higher process, the operations may be supposed to be more refined and regular in proportion to the superior refinement of the elements and dynamic agents which are involved. These suns assume specific distances and orbits determined by the laws of equilibrium, and com-

mence their harmonious actions and reactions upon each other, developing a *sixth* law—the law of universal cosmical sympathy and reciprocation—corresponding to the nervous sympathy and reciprocal action existing between the different organs of the human body, the *little* universe.

The *seventh* and last law and process in this series of universal creations, is that by which planetary masses—bodies destined to become ultimately habitable—were evolved from the previous solar masses. Of course it is to be supposed that these bodies were produced from the solar masses by evolutions of nebulous rings, and by agglomeration of the materials of these, according to principles before explained. This development completes the fundamental structure of the material universe *as such*, and serves as the Basis and material Germ of all subsequent and more refined unfoldings.

The different stages through which the universal mass of materials have passed, from germinal to ultimate forms, may therefore be summarily represented in the following formula:

PRIMARY TRINITY.	SECONDARY TRINITY.
1. Heat-pervaded chaos.	4. Concentric nebulous rings.
2. Luminous attractive nucleus.	5. Segregated masses (from rings).
3. Electro-interactive spheroid.	6. Suns and clusters of suns.
ULTIMATE	
7. Habitable worlds.	

It is true that we can have no final and absolutely *sensuous* demonstration that such is the structure of the universe, because the telescope, with all its magic powers, has probably revealed, as it were, but an infinitesimal fragment of the great united System. Yet, considering that the telescope has explicitly revealed that the same laws of gravitation and revolutionary motion which apply to our own planetary worlds, apply

also to the most distant clusters of stars, thus binding all systems and firmaments together in one family relation, and referring them to a common parentage—considering, therefore, that our own solar system is of itself a *little* universe, exemplifying all the principles involved in the *great* universe, of which it is a child and antitype—and considering, as we may now well do, that the nebular hypothesis of creation is the correct one, and that laws are uniform throughout the whole realm of being—the preponderance of analogical evidence must, we think, be admitted to be in favor of the *general* truthfulness of the theory here propounded. For, in the first place (admitting the nebular hypothesis), our own sun, enthroned in the midst of our system, affords an ocular proof that matter in a primitively diffused state, and obeying the impulses breathed into it from the Divine spiritual source, *will* assume a central, gravitating, and rotating Nucleus; and this hints at the *great* Nucleus, which, on the same principles, seemingly must have *necessarily* been formed in the midst of the originally chaotic materials of the whole universe. Moreover, the rings of Saturn show the forms naturally first assumed by the attracted and emanated materials of a central body, which forms will be of varying distances from the central body, according to their specific degrees of density or levity. Some such forms seemingly must have *necessarily* been elaborated, not only by our own central sun, but by all other suns of sufficient magnitude and activity, and especially by the great Sun of all suns. But such annular forms, of course, can be preserved through subsequent condensation, only in case of the nicest equilibrium in their materials and motions, such as is characteristic of Saturn's rings. If there is any considerable inequality in either of these particulars the annular mass, in contracting, will inevitably resolve itself into the form of one

or more bodies, whose orbit of revolution will be such as was described by the position of the previous ring.

This consideration not only explains the origin of the planets satellites, and asteroids, of our own solar system, from the materials of previous nebulous rings, but suggests that analogous singular and multiple conglobations must, *seemingly of necessity*, have, in like manner, been formed in the sidereal spaces, from the materials of nebulous rings surrounding *their* respective centers, these all being subordinate to a *final* and *common* Center, as all created things proceed from a final and common Cause.

We may, therefore, say, that there are many avenues open toward the hypothesis we have propounded respecting the origin and structure of the universe, and many guide-boards (or facts and principles), pointing along these avenues, all in the same *direction*; while, if the mind attempts to travel in a different direction, and in quest of other conclusions, it not only finds no such guide-boards to direct it, and no such avenues open for its passage, but it is constantly obstructed by barriers of philosophical difficulty, and each of the steps of its progress is planted only on the miry and treacherous ground of *assumption*. While, therefore, the mind is ever held open to the reception of new light, and a willingness is preserved to abandon, any present errors for the sake of subsequently unfolded truths, it would seem that we might, without subjecting ourselves to any just charge of philosophical rashness, settle, in the present conviction, that the foregoing hypothesis, at least, as to its *general* and *most essential* principles, can not vary much from the truth.

latter ball. But there are a great many chances against both balls striking in such a line, and if we suppose a *constant stream* of balls (corresponding to particles) flowing inward toward the central ball, the probability of the latter being soon struck a little out of the line of its center, would amount to an almost absolute certainty. In case this should happen, a rotary motion of the central body would necessarily take place as a result of the *momentum* of the body or bodies impinging upon it, especially if the latter bodies, as a result of magnetic or other attraction, attach themselves permanently to the surface of the former while still under the influence of this momentum.

Suppose, then, there is a constant stream of bodies flowing inward from all directions toward the central body, as is supposed to be the case with particles of nebulous matter flowing inward toward a common center; the rotation of the central mass itself when once established, will, by the friction of its revolving atmosphere, if from no other cause, be sufficient to throw the approaching end of every radial line of gravitating particles out in the *same direction* from its center, and thus the momentum of every impinging particle will add to the tendency to central rotation. As the particles gradually establish relations with each other, through their various degrees of attenuation from center to circumference, rotation will gradually be established throughout the whole mass, the motion being relatively swift at the center, and gradually growing slower at every remove toward the circumference, where it is the slowest.

The idea has been illustrated by a reference to the effect produced by different currents of water flowing toward a common center, which effect is well known to be that of a *whirl*, rapid at the point of meeting, and growing more tardy at

every remove from said point, until it dies upon the shore, or is lost in the general motion of the stream.

If we have in these principles, as we appear to have, a sufficient account for the origin of all rotatory motion in the celestial spaces, it were certainly unphilosophical to look for its origin in any foreign or arbitrary impulse.

All the phenomena we have thus far considered, therefore, may be traced to the operations of two laws, viz., Expansion and Attraction—the first being based upon Heat, and the second upon Heat and Light combined—which elements, again, owe their origin to the corresponding principles of Divine Love and Wisdom, or *spiritual* Heat and Light. We come now to consider the operations and results of a third law—the law of *Circulation*.

While men of science have minutely traced the operations and phenomena of *gravitation*, they have taken comparatively little cognizance of any *reactive* force from the attracting body. Yet, without the aid of a reactive or emanative force, to counterbalance, in some measure, the gravitative power, it would be impossible to conceive, on rational principles, of the formation of any other body than the first and universal Body, which would selfishly absorb all materials, and give forth none. But it would only be in accordance with universal analogy, to suppose that while this constant *secretion* was going on, there was also as constantly kept up a countervailing process of *excretion*. Particles absorbed into the central mass (or, what is the same thing, the denser portion of the whole united mass), would, by the action of its superior vitality, undergo a *quasi* process of digestion, and portions of their essence would become refined and sublimated, and would be sent off again into space, to the *opposite* materials of which they would in their turn be *attracted*, in the same way as positive and negative

electricities are mutually attracted. As *all* gravitating particles can not go absolutely to the center (some being crowded out by others), and all emanated particles can not, for a similar reason, recede to the circumference, so each finds an equilibrium, and takes a position, between center and circumference, according to its specific density or levity. And now, a similar process of digestion necessarily goes on among gravitating and emanating particles which find their common equilibrium at any given distance from the center, and by their mutual action and reaction, another change and excretion takes place, and the rejected particles, being in a state exactly opposite to that of the particles thrown off from the great Center, now gravitate again toward that Center, there to experience and produce still further changes. Thus there is a constant action and reaction, flux and reflux, between center and circumference, and between all intermediate parts of the great mass; and the law governing this reciprocating movement is what we mean by the law of *Circulation*. It corresponds to circulation, or to the flux and reflux of venous and arterial blood to and from the heart in the little universe, or the human system, even as the laws of *Expansion* and *Attraction* (or contraction), before considered, correspond respectively to the diastolic and systolic motions of the heart, lungs, and perhaps the minute vesicles, or "corcula," of the brain. Being the third law of the universe, it corresponds to the third element of the Divine essential Constitution, which is the Divine Sphere of operative Energy, which, again, corresponds to the nerve-essence in man, and which latter corresponds to Electricity in the universe—this being actually the agent mainly concerned in the production of the phenomenon now under special consideration.

The laws of Expansion, Contraction, and Circulation, therefore, form a *trinity*, as dependent upon the triune elements

of Heat, Light, and Electricity; and which latter are related to the corresponding three-fold Divine spiritual elements of Love, Wisdom, and Vehicle of operative Energy.

The *Fourth* law, is a law of *Organization*, and brings the elements and motives previously developed, into a state of systematic and serial *Aggregation*.

Before rotatory motion is fully established in the mass of matter, the gravitating and emanating particles would proceed *toward*, and *from*, the center, in nearly *straight* lines. But after said motion is fully established, and becomes general throughout the mass, both kinds of particles would proceed in aberrant or *curved* lines, the curves corresponding to the direction of motion in the revolving matter—in the same manner in which a person attempting to row a boat in the direction of a radius of a circle or vortex of water flowing round a center, would, if he kept the side of his boat always square to the stream, be carried out of a direct line a distance proportioned to the rapidity of the current, and would thus describe a *curved* path.

But it is evident, for reasons already intimated, that neither can *all* the gravitating particles take, at any one time, a position *entirely* at the *center*, nor can all the emanating particles take a simultaneous position *entirely* at the circumference, but that each will assume a position with reference to the two extremes, where it finds an equilibrium, and will keep this position until a change fits it for another. Suppose, then, that a gravitating and emanating particle are in exactly opposite states to each other in respect to their degrees of *positiveness* or *negativeness*: it is evident that both particles would find a common equilibrium only at the same distance and position between the center and circumference. They would there meet, and by virtue of their elective affinities, form a union as male and female particles, and would assume

a *circular* or *orbital* motion, coincident with the rotating motion of the general mass, *which* MOTION the united momenta of their previously gravitative and emanative movements would tend to sustain.

Now, supposing that there were originally just seven kinds or classes of atomic particles (no matter into how many more kinds or classes these were susceptible of being subdivided), it is easy to perceive that the foregoing principles would probably involve something like the following results: one class of atoms, rejecting the immediate companionship of all others, would cluster around a central point, and form a sun. Each of the other six classes of atoms, in like manner, rejecting the immediate companionship of other atoms, while obeying the impulses of its internal and strongest affinities, would assume a general distance from the center determined by its specific point of equilibrium, and there, contracting upon itself, would form a mass of its own, in the general shape of a *ring*, surrounding the interior solar mass. Here we have a law of *deposition* and *aggregation*, corresponding to the law by which particles, circulating in the human blood, are deposited and aggregated in the form of muscle, cellular tissues, etc.

The universal system, as thus definitely organized, would, therefore, supposing that there are seven general varieties of matter, present the form of six concentric rings of nebulous matter, surrounding the seventh formation, which is the central sun. But if there were a greater or less number of kinds of matter, there would be a correspondingly greater or less number of rings, but all constructed on the same principle. Of this annular structure we have a general analogue, though on a small scale, in the rings of the planet Saturn, and also on a larger scale, in the annular nebulae, of which there are a few examples in the heavens.

It should be added, however, that the idea of this concentric annular form of structure can only hold when associated with the supposition, that the primitive point of general gravitation was at, or near, the *center* of the chaotic mass. If the gravitative point was far out of the center, then the evolved masses, instead of assuming the forms of *circles*, would assume the form of *ellipses*, having a preponderance of their materials on one side of the sun, where, indeed, the *whole* might be subsequently drawn by the superior gravitating force of their major quantity, and form a separate revolving mass. In either case, however, the fundamental *principles* involved would be the same. But of the general prevalence of the annular, or, at least, elliptical form of structure, in the sidereal realms, there is a sufficiency of ocular proof, as incidentally exhibited in a previous chapter.

The FIFTH law, governing a corresponding fifth development, is the law of SEGREGATION, by which the materials of the previous annular formations, obeying *higher* and more *specific* elective affinities, separate into different masses, of *higher and lower degrees of refinement*.

The nature and *modus operandi* of this law, may be understood by the following considerations: The completion of the last or circular formation, brings the materials of the universe to a *triune degree* above their primeval or chaotic state. Of course, therefore, not only the essences, but the activities and inter-activities of the whole structure, are more refined, diversified, and systematic. Each nebulous ring is now itself a comparatively independent theater of molecular force and motion, and all of them act upon each other by their gravitative and emanative forces, while the central sun, as the great heart of the system, continues to send forth his vivifying and generative influence to all.

CHAPTER VIII.

THE SEVEN DYNAMIC AGENTS OR POTENTIAL MEDIA OF NATURE.

To facilitate a clear conception of the relations of the Deity to, and his mode of acting upon, the universe, as well for other important uses, we will now endeavor to attain to some further conceptions of the *dynamic agents* immediately connected with the seven general laws, and their corresponding seven-fold developments, considered in the foregoing chapter.

It was before intimated, on grounds which appear even to transcend mere probability, that the agents immediately concerned in generating in the universal chaotic mass, the first three phenomena of Expansion, Contraction, and Circulation, were Heat, Light, and Electricity. By the agency of these three principles, we have supposed that the mass was successively developed from a chaotic, to a nucleated, and spheroidal form. Another and corresponding trinity of agents was hinted at, which will now form the subject of special consideration and illustration.

In unfolding the doctrine of the seven-fold series, it was shown that the fourth, fifth, and sixth members of such a series, composing a *Secondary Trinity*, bear a certain correspondence, respectively, to the first, second, and third members, which compose a *Primary Trinity*. Thus, as the *Primary Trinity* of conditions in the universal material mass,

consisted of the chaotic, the nucleated, and the spheroidal, so the Secondary Trinity (comprising nebulous rings, segregated and contracting fragments, and developed solar forms) may be characterized as secondary chaos, secondary nucleation, and secondary spheroidation. This being so, and the dynamic elements of the first Trinity being Heat, Light, and Electricity (each probably in a gross degree of development), a carrying out of identical principles will lead to the supposition that the dynamic agents *peculiar* to the *Secondary* Trinity, are such as would *correspond* to Heat, Light, and Electricity, in a *secondary* degree of development, so to speak, without, however, supposing that they are absolutely *identical* with Heat, Light, and Electricity, as these terms would ordinarily be understood. This, however, is a mere deduction from principles and correspondences; let us now see if there are any substantial *facts* to support it.

Such facts are involved in a series of interesting and most important discoveries, made by BARON VON REICHENBACH, a few years ago, and of which we will now speak briefly. The course of experiments which led this ingenious philosopher to the discoveries in question, was commenced by testing the properties of magnets. By the assistance of a number of delicately organized persons, mainly cataleptic patients, in whom the senses, especially *sight* and *feeling*, were in an uncommon degree of exaltation, he ascertained that from either pole of an open magnet, there was constantly given forth a *luminous, flame-like appearance*, visible in a dark room, but only to such as possessed this uncommon acuteness of vision. The flames sent forth from the poles of a large horse-shoe magnet, capable of supporting ninety pounds, were described as about eight inches in mean length, mingled with iridescent colors, and gently flickering and waving, shortening and

elongating, and yielding when blown upon, and when the hand or any other solid body was passed through them. The whole appearance was described as being exceedingly beautiful.

This experiment was repeated with many different observers, from all of whom the same general description was obtained—the accuracy of which was further tested by varying the experiments without the knowledge of the observers, and noting the corresponding and uniform variations of the appearances described.

But, in order to obtain still further assurance that those luminous appearances described by others were real, though invisible to himself, the experimenter, by the aid of another scientific gentleman, instituted the following additional test: A very sensitive daguerreotype plate was prepared and placed opposite to a large open magnet, in a closed box, enveloped in thick bed-clothes, so that not a particle of ordinary light could enter it. After the lapse of sixty-four hours, the plate, when exposed to mercurial vapor, was found to be distinctly affected, as by light. Another plate had been, at the same time, similarly prepared, and inclosed in a dark box, *without* a magnet, and after a similar length of time this was found to be entirely unaffected.

The light was also subjected to the test of the convex lens, and was found to be converged and thrown upon the wall in the same way as any other light, *but at a considerably greater focal distance*, which fact of itself proves that the luminous substance was different from ordinary light.

By tests similar to those which were employed with the magnet, it was subsequently ascertained, with equal certainty, that similar lights were also emitted from *crystals*. The flames issuing from the points of large crystals were described by

those who could see them, as being somewhat in the shape of a tulip, and singularly beautiful. One young lady used, when ill, to lie awake nights enjoying the sight of the beautiful flame emitted from a large rock crystal which had been left in her room. But bodies confusedly crystalline exhibited but little of this phenomenon, and bodies entirely amorphous exhibited none, but nevertheless gave forth, in common with crystals, magnets, and other things, a still more subtle influence, which will hereafter be described.

Our experimenter subsequently introduced other tests with the view of ascertaining to what extent this newly-discovered force prevailed in nature. He extended the end of a wire through the keyhole of the door of a perfectly darkened room, in which he placed a person whose senses were sufficiently acute to detect any luminous or other phenomena which might present itself as the result of any experiment. The other end of the wire he attached to a metallic plate, which, without letting the observer placed in the room know what he was doing, he would push out into the rays of the sun, or of the moon, or of the planets, or fixed stars; or would place an animal, a plant, or his own hands, upon its surface; or would subject it to chemical action, or the action of heat, cold, or electricity. He found the results of all these experiments nearly uniform in one particular, viz., in respect to the emission of a narrow tuft of light several inches in length, from the end of the wire, which would begin to be visible soon after the agent experimented upon was brought to bear upon the plate. Indeed, whatever possessed in itself the least molecular force or action, was found to be capable of evolving a greater or less degree of this luminosity.

Other processes gave an *analysis* of these lights, and showed remarkable relations in their constituents, to different points

in the terrestrial and celestial spheres. It was found, for example, that the flames from the poles of a large electro-magnet (which were much larger and brighter than those emitted from the permanent steel magnet) would, after the galvanic circuit was completed, slowly and gradually resolve themselves into distinct stratifications of color, presenting, in fact, the seven-fold luminosity of the rainbow, with the red below and the violet above. These colors, again, were found to vary with the varying distances at which they were viewed—the whole of the appearances, when taken together, showing that each one of the differently colored radiations terminated, for the most part, at a certain distance from the common center of luminosity. This distance, though Reichenbach did not remark it, was probably nearly the same all around; the differently colored rays thus forming a system of concentric spheres of light.

Guarding against errors which might arise from variations in these colors as resulting from the varying distances at which they were viewed, our philosopher was now prepared for another interesting step. Having previously found that a magnetic bar, with poles in the direction of the dip, always emitted different colors from those it gave in the meridian, he proceeded to ascertain what effect other positions of the pole would have upon the character of the luminosity. For this purpose he caused a magnetic bar to revolve lengthwise, first in a vertical circle in the direction of the magnetic meridian, then in a vertical circle in a direction east and west, and lastly, in a horizontal circle. He found that in each case different colors were evolved according as the magnet was pointed in different directions, *and that as it passed, in each case, through a complete circle, it evolved, in regular succession, all the colors of the rainbow!*

By subsequent electro-magnetic experiments with an artificial globe called the *terrelle*, Reichenbach succeeded in precisely reproducing the appearances of the *aurora borealis*, and may be considered as having probably afforded a complete solution of that interesting phenomenon.

We find in these remarkable facts a complete verification of our previous hypothesis, so far as it relates to an essence which may be called *secondary light*. While this light is, in some particulars, similar to ordinary light, it differs from it totally in others, as the foregoing description renders obvious; and it therefore may be judged to belong to a somewhat *different degree* of natural developments. Considering this, therefore, as one of the members of our supposed Secondary Trinity of imponderables, we shall now see that our hypothesis, so far as it relates to the other two members, is not without the support of similar facts.

When a horseshoe magnet was closed by an armature, all appearances of a luminous flame would immediately cease, but would be instantly reproduced on the removal of the armature. This establishes the probability that the same force which in the open magnet generates the luminosity, is, by the application of the armature, simply rendered *latent*, so far as its flame-generating power is concerned, but that it nevertheless still exists in the closed magnet, and acts as an *internal principle*, or as a principle corresponding to fire or heat. This view is further confirmed by the fact that one of Reichenbach's subjects saw even closed magnets, and, indeed, metals of all kinds, luminous in the dark, as though they had been heated to incandescence—without, however, giving forth any flame-like scintillations. Such, then, are the evidences of a *Secondary Heat*.

But still more conclusive indications were obtained of an

electroid, or *electricity-like* agent, as connected with the identical sources of these other phenomena. It was found that magnets, crystals, or whatever afforded the phenomena of this attenuated light, together with many things which did not, also emitted an influence or *aura* which was capable of acting decidedly upon the nerves of a certain proportion of persons. This *aura* was described as warm or cold, according as it was received from either pole of the magnet or crystal, or according to the positive or negative quality of any other source from which it was obtained. It was found capable of acting at a distance, and of being transmitted through conducting media, and of sometimes acting so powerfully upon the sensitive as to produce catalepsy and dangerous spasms. Thus, at one time, during the illness of one of Reichenbach's employées, he held a large magnet, capable of supporting ninety pounds, at the distance of six paces from her feet, as she lay on her bed, with her physician by her side. While the armature was attached to the magnet she felt no peculiar sensation, but the instant it was removed she fell into tetanic spasms and complete unconsciousness from its action. The armature being again attached, the girl slowly recovered her senses, and her physician advised that the experiment should not be repeated. Another lady, subject to attacks of catalepsy, could instantly detect the approach of an open magnet, though the latter was brought, without her knowledge of the intention, near the head of her bed, on the opposite side of the wall.

Magnets, crystals, etc., were also found to powerfully *attract the hands* of cataleptic patients, even during the unconsciousness of their fits.

It was also ascertained that amorphous bodies, in common with others, sent forth this ethereal influence, though, as before

shown, they gave forth *no light*. And here it was more fully ascertained, *that the ethereal emanations from different substances, were specifically different* as to their effects upon the human nerve, thus affording indications of the distinctive characters of the emanating sources. One peculiarity of amorphous (that is to say, uncrystallized and unorganized) bodies was, that their exhalations gave a nauseous, accompanied by either a cold or warm, and sometimes also a prickly, sensation, to persons whose nerves were in a sufficiently sensitive state to test them; and some bodies imparted these sensations in a greater degree than others. In the investigation of this point, Reichenbach took the trouble to try more than six hundred bodies with reference to their nauseating force. The young lady through whose aid the tests were made, could easily give to every substance its proper place in the scale of force, and this she could repeat, without failure, after intervals of several days. "It soon appeared," says our philosopher, "that these bodies arranged themselves according to their electro-chemical value, and, indeed, in suchwise that the highly electric stood at the top, and the indifferently so at the bottom of the scale, without regard to their polar opposition."

When the same substances were tried on this same young lady while in a state of catalepsy, "the results were the same in kind, but in degree much stronger. The substances at the top of the scale, laid in her hand, caused violent spasms, whereby they were thrown at a distance, and her hand then, as usual in catalepsy, retained the new position. . . It was soon observed that many substances began to act before they touched the hand, and it was enough to place them near it."

These experiments were repeated, not only with other nervous patients, but with several gentlemen in a state of per-

fect health, with results differing from the above no more than what might easily be accounted for by the different degrees of susceptibility in the experimenters. The different substances tried are enumerated by Reichenbach according to their specific effects, but it will here be sufficient to say that *sulphur* was found to be the general representative of those which, without contact, gave the sensation of *cold*, and *gold* of those which gave warmth; and almost every one whose hand was made to pass over small plates, coated respectively with these substances, felt, in some degree, these corresponding sensations, and some felt them quite vividly.

Without any knowledge of Reichenbach's investigations, Dr. G. R. Buchanan, of Cincinnati, was engaged, about the same time, in a similar course of experiments with amorphous bodies, and developed results similar in character, but in some respects even still more decisive. Without here entering into the details of his experiments or inquiries, it will be sufficient to state that they resulted in establishing the fact, that *medicines*, holden in the hand of the patient, even when wrapped up in paper and concealed from view so as to guard against the effects of imagination, will, in a large proportion of cases, have all the effects that the same medicines will have, taken internally. Out of about one hundred and thirty medical students belonging to a class which attended the lectures of Dr. Buchanan, forty-three declared themselves fully affected by this experiment, to which they had been subjected during the delivery of one lecture.*

Similar phenomena have been observed as the results of similar experiments in other instances, but we have no room for further details on this branch of our subject. In all such

* See "Buchanan's Journal of Man" for February, 1849, Art. 1.

cases the action of the medicines is doubtless due to an absorption of their subtle and *characteristic* emanations, through the pores of the skin, whence they are diffused through the nervous medium of the system, acting upon the vital forces which control all the functions of the physical organism.

By experiments which placed deception out of the question, it was found that these ethereal influences of different substances, could be conducted through wires to a distance of from three to one hundred and thirty-two feet, so as to be distinctly perceived by the more sensitive of Reichenbach's experimenters.

But a fact still more important in its bearings was, that different bodies placed in contact with, or in close proximity to, each other, would mutually impart their influences to each other, so as to modify or totally change the effects which they would otherwise produce upon sensitive patients. In other words, and to use a figure of speech that will be perfectly understood, they would mutually *magnetize*, or *mesmerize*, each other—would enter into a sort of *rapport* or reciprocal sympathy, by an interdiffusion of their spheres or ethereal emanations. Thus it was found that sulphur, which of itself would impart a cold and prickling sensation to impressible persons, even at a distance of several feet, and without a conducting wire, would, by contact or close proximity to other substances, empower them, for a time, to give forth a similar influence, even though their own proper influences might be of an opposite, though less powerful, character; and so of other substances, and their modifying influences upon others.*

The general reliability of the foregoing and other alleged

* For further details of these interesting experiments and their results, the reader is referred to Reichenbach's "Physico-Physiological Researches on the Dynamics of Magnetism," etc., New York. J. S. Redfield.

results as obtained by Reichenbach, will not be disputed by those who know the character of the experimenter, or who, from a careful perusal of his report, have noted his exceedingly cautious mode of proceeding. Reichenbach is known throughout Europe as a chemist second only to Liebig himself, and, speaking of this same course of investigation, Professor Gregory declares that "it was not possible for any experiments or discoveries to be presented to the scientific world by one more entitled to confidence in every point of view." Besides this, his more important experiments have been repeated by others, and their results verified, in many instances, both in this country and in Europe.

Availing himself of the plasticity of the German language, Reichenbach designates the new force (rather *forces*) which he discovered, by the German suffix "*od*," and indicates the sources whence this force is obtained, by their names prefixed to that syllable, as "*magnetod*," "*crystallo*," "*thermo*," "*photod*," etc., as respectively indicating a connection of the force with magnets, crystals, heat, light, etc. In the English language, therefore, this new imponderable has been rather clumsily designated as the "*odic force*," or "*odylic force*."

But the various phenomena exhibited by this so-called force, show that it is not simple but complex, or rather that it involves a number of distinct forces. Its rudimental existence in the closed magnet, as also in various unmagnetic bodies, was not only intimated by the luminous and incandescent appearance of the bodies of metals, before spoken of, but is also implied as an antecedent of the luminous, flame-like appearance which it engenders at a further stage of development—just as the existence of common caloric is implied as an antecedent of common flame. The light itself is a *second* development; and the ethereal *aura* which, without any luminous

phenomena, acts upon the human nerve, is a *third*. The three, therefore, may be variously characterized as "odid heat," "odid light," and "odid electricity," or "odid ether;" and here we have our previously conjectured Secondary Trinity of dynamic agents, corresponding to the Primary Trinity, which consists of Heat, Light, and Electricity, as these terms are ordinarily understood.

In the same way in which the *Primary* Trinity of dynamic agents is concerned in the Primary Trinity of each system of physical developments, the *Secondary* and *corresponding* Trinity (in connection with the Primary, which is *still* and *always* in force) is concerned in each *secondary* and *corresponding* Trinity of developments, with their peculiarities.*

Thus the principle which we have called "Odid Heat," may be considered as the internal love-principle by which particles associate in organic forms, and therefore is the *fundamental* dynamic principle connected with the fourth law—the law of *Aggregation* or *Organization*, whether relating to the universe as a whole, or to any of its definitely constituted parts.

The "odid light" appears to be expressive of the ethereally aspirative operations of the organic structure from which it proceeds. It was before mentioned that this light consisted of the seven different colors of the iris, which seemed to surround the center of luminosity as so many concentric spheres of light; and that when Reichenbach caused a magnetic bar to revolve lengthwise on horizontal and vertical planes, the light exhibited successively all the different colors of the rainbow, as the magnet was pointed in the different directions in respect to the earth and heavens, which lay in the plane of the

* It is not claimed that these dynamic principles apply *identically* to each and every seven-fold system of developments, as to some systems they apply only by their natural representatives, analogues, or correspondents.

circle. I can not but regard these results as exceedingly interesting and important, as showing the relative degrees and states of *polarity* of particular points and directions of the earth's surface, and of the surrounding and celestial spaces—thus, as suggesting the different *qualities* or *states* of the materials of which the earth and all correlative creations are composed—thus, as suggesting the correlative *affinities* and *forces* by which these materials became associated in their present structural form—and finally, as suggesting something of the perpetually repeated round of changing influences and ethereal forces through which (in analogy to the revolving magnet) the earth and all celestial bodies pass in performing their rotary and orbital revolutions. If there is any validity in these suggestions, then these degrees of polarity, states and affinities of matter, changing ethereal forces, etc., all exemplify the *seven-fold series* as corresponding to the seven colors of the iris, which, in the experiment referred to, were successively given forth by the revolving magnet. And, applying these remarks (as analogy would justify us in doing) to *all* mundane organizations—to the solar system, the sidereal systems, and to the whole universe as one Body—as well as to the earth, we have in the “*odic light*,” a universal dynamic correlative of the *fifth* law—the law of *segregation*, or the law by which unity is divided into parts of different and connected gradations.

Concerning the *third* member of this trinity of agents—the “*odic*,” electroid, or ethereal emanation which was found to produce such marked and singular effects on the sensitive human nerve, the following remarks may be submitted :

1. All things subjected to careful experiment, whether in the animal, vegetable, or mineral Kingdoms, or in the celestial spaces, were found to send forth this subtle eman-

ation, which in each case may be called the *sphere*, or ethereal atmosphere, of the substance or form from which it proceeds. It may therefore be presumed, on analogical grounds, that things also not available for experiment, and that, indeed, absolutely *all* things, from atoms to worlds and systems, and even the whole universe, considered as a Unit, are in like manner characterized by a surrounding and pervading ethereal sphere.*

2. The emanating spheres of smaller bodies associated with larger ones, must necessarily be *included in* the emanating spheres of the larger bodies on which they rest or depend. The sphere of a single particle of mineral matter, for example, is comprehended and encircled in the general sphere of the whole crystal of which it forms a part; and the same remark applies to particles and organisms in other kingdoms in nature. The spheres of all minerals, vegetables, animals, etc., separately and collectively, are involved and comprehended in the general sphere of the earth; the sphere of the earth, together with the spheres of all other planets, with the satellites and comets, is involved and comprehended in the general sphere of the whole solar system; that sphere is comprehended in the general sphere of the great stellar vortex in which, accompanied by myriads of like systems, it moves; and that sphere is comprehended in the general sphere of the whole Universe; and that sphere is, in like manner, enveloped in, and pervaded by, the great sphere of the infinite Divine Being, which is the Essence of all essences, the Force of all forces, and the Vitalizer of all vitalities! Here, then, is a

* This doctrine of "spheres" was taught by Swedenborg, and by others since his day. It may almost be said that it has a sufficient foundation in the developed intuitions of the human mind, and it would stand even independent of Reichenbach's most conclusive scientific verifications.

progressive gradation from the smallest to the greatest, from the infinitesimal to the Infinite, from the atom of matter to the incomprehensible fullness of a Divine Spiritual Being.

3. The spheres of all bodies in the universe, from smallest to greatest, while they are *generically similar*, are *specifically different*, and the sphere of each body corresponds to that body's internal character. This is a conclusion which, as regarded merely by the reasoning powers, is necessitated, by the obvious differences in the intrinsic nature of things, and it is confirmed by the differences in the effects produced by the ethereal emanations of medicines and other substances, and even by the heavenly bodies, and by different districts of the celestial hemisphere which were subjected to tests.

4. As it was proved that the spheres of sulphur, gold, medicines, etc., acted and reacted upon, and *mutually modified*, each other, and this, too, when the solid bodies were a distance apart; so, carrying out this principle, it may be presumed that the spheres of *all* bodies, terrestrial and celestial, from smallest to greatest, from atoms to worlds, stellar systems, and the whole universe, in like manner, *act and react upon, and modify each other, according to their relative degrees of magnitude and power*. And this mutual interdiffusion of spheres, and their harmonious and reciprocal action and reaction upon each other, while each particular form and system preserves its own identity, constitute an important part of the *physiological and functional operations of the great Anatomical Structure of Creation*, and which, as before intimated, corresponds, in principle, to a single human body. The great ethereal Sphere of *all* spheres may be considered as the *sympathetic nerve-essence* of this Anatomical Structure, viewed as a whole, while the sphere of each sun, world, and atom, may be considered as its *own particular nerve-essence*; and it

is through these nerve-essences that each part of the whole Body sympathises with all other parts, and that the equilibrium and harmonious functional operations of the whole system are preserved.

This subtile and variously qualified electroid or magnetoid element, therefore, being the *sixth* in the seven-fold series of dynamic agents, is intimately allied to the sixth general law, which we have seen is a law of harmonial and sympathetic reciprocation.

It is true that the discoverer of these previously unknown subtile agencies did not exhibit, and perhaps did not, to any extent, perceive their *cosmological* bearings, especially as these are attempted to be set forth in the foregoing remarks. His main object appears to have been to develop *facts*, leaving the more comprehensive *conclusions* to which these might naturally conduce, to be unfolded by subsequent investigations, and by others as well as by himself; and as his facts, by their publication, and their verification by the parallel experiments of others, have become the property of the world, any one may elaborate and synthesize them who has the inclination and mental qualifications to do so.

In respect to this "odic," or magnetoid element, which pervades and emanates from greatest and smallest things, the following additional and important remarks may be submitted: As this influence, proceeding from various bodies, near and remote, was found to have such remarkable effects upon the sensitive human nerve, it may be considered as being closely allied, in its general nature, to the nervous influence pervading the human body, and emanating from it as an "odic" sphere. Indeed, Reichenbach actually proved its identity, in the general sense, with the medium through which one human being produces those effects upon another, com-

monly known as "magnetic" or "mesmeric;" and the world is indebted to that philosopher for physical demonstrations in this department, which place the fundamental doctrines of Animal Magnetism beyond all possible doubt.

Now, operations called "*magnetic*," as performed by one human being upon another, are known to depend greatly, for their character and efficiency, upon the exercise of the *will*. If, therefore, the medium through which such magnetic operations are performed, is generically the same with the "odic" spheres given forth by all bodies in nature, do we not find in this "odic" element *the general connecting link between mind and matter*? If, upon the basis of this certainly plausible idea, we should suggest that this everywhere present "odic" element, as associated with the different bodies in nature, and with nature as a Whole, may hereafter prove to be a medium through which mind can, in certain conditions, and to a certain extent, act upon and move outer tangible matter, without the contact of the physical organs, the suggestion would doubtless be met with general incredulity, especially by those who are not familiar with certain strange phenomena of our day. It could not be esteemed more incredible, however, than would have been an assertion made fifty years ago, that by a peculiar mechanical contrivance, a certain subtile agent in nature might be efficiently employed in the accurate and instantaneous transmission of thought to the distance of a thousand miles! But not to press these thoughts for the present, if our foregoing generalizations are correct, then we hazard little in saying, that as the all-pervading "odic" sphere of the universe, as a whole, in its ultimate degree, connects with the sphere of the Deity, *so the Deity, through this medium, acts upon the universe, in the same way as any two juxtaposed substances or forms in nature act upon each other*

through their "odic" spheres, and as was illustrated by experiments before related. And as the Deity, moreover, is a *personal* and *intelligent* Being, he may through this medium act, not only *spontaneously*, but *volitionally* and *directly*, upon the universe, or upon either of its corresponding sub-creations, and control it to any extent which may comport with the integrity of his general plan.

But we come now to another point: As each previous stage of creation, with its peculiar law of developments, from the first to the sixth, was thus accompanied with, or related to, a corresponding dynamic agent, the same fact may be supposed to hold with reference to the *seventh* stage, which, in the cosmical creation, as before shown, consisted in the development of *habitable worlds*. And as this is the *final* development of the seven-fold cosmical series—and brings the physical structure of the universe *as such*, to a completeness—so we may suppose that the *dynamic principle* related to this development, is also the ultimate and completion of *its* series. And being the last of a series in which there is observed a progressive refinement from the first, at least to the sixth, it may be supposed to unite in itself the principles of all the others in a still superior degree of refinement.

But we have seen that the series of universal cosmical developments included in what we have called the great Kingdom of Materiality, must have been based upon, and have sprung from, an antecedent, unoriginated, and *infinite* Kingdom of Spirituality, which we call God. If this same Principle, like the vital elements of the germ of a tree, lies at the basis, and is reproduced at the completion, of the unfolding, then this seventh dynamic principle, concerning which we are now inquiring, can be nothing less than a *degree of the seven-fold elements of the originally generative Divine Spirit, now em-*

bodied in cosmical investiture. Viewed in this light, this seventh dynamic principle may be called *Soul* or *Vitality*—the Soul or vital Principle of the cosmical universe, or the Principle by which it, *as a universe, lives* and performs all its normal movements !

Let me not, however, be understood as intimating that the *all* of God was thus embodied in the universal cosmical structure. Neither the universe of material worlds, nor of heavens, nor the heaven of heavens, can contain HIM who is absolutely INFINITE, and it must have been, *comparatively* speaking, an exceedingly small ray from his interior and ineffable effulgence that sufficed to give birth to, and move and regulate, the material structure which we have been contemplating, however sublime and inconceivable to human intellect this may be. Nor was the Divine embodiment of which we speak, necessarily an embodiment which, in its immediate exterior manifestation, would take the form of what is generally understood by *intelligence* ; though intelligence, as an attribute of a much higher and more interior degree of the Divine Spiritual Constitution, was the projecting, planning, and (acting through the ultimately refined “*odio*” spheres, or *quasi* nerve-essences of his creations, before spoken of) is the constantly supervising and all regulating Principle. The Divine qualities *as* intelligence were subsequently and, at a much higher degree of creative progression, finitely expressed in the *human microcosm*, which is expressly declared to be an “*image of God*.”

It is, however, here submitted as a truth which, it is believed, will become more evident in proportion as its foundation and bearings are better understood—that the *identical principles* of what we know as *intelligence*, are embodied (though not *as* intelligence) in each kingdom or system of creation *below* man, and finally in the universal kingdom of

cosmical forms; these various descending embodiments bearing to each other the relations of descending octaves. Thus what is called *intelligence* in man, is called *instinct* in animals. But *plants* also, have a kind of instinct; and so in lower degrees, have minerals, worlds—the whole universal System of worlds—each embodying and representing a lower degree of what may receive the general designation of Love, Wisdom, and Volition; or Expansion, Attraction, and Circulation; the lowest triune degree of which is embraced in the functions of Heat, Light, and Electricity.

The seventh dynamic principle of the universe, therefore, which pervades and governs all other principles, is only an embodiment of that degree or octave of the principles of the Divine soul which is in immediate relation with, and serves to control the functional operations of, the universal cosmical Body; while the *higher* degrees of the seven-fold Divine harmonies, flowing downward from the infinite sources of Divinity, are left to be embodied and represented in subsequent and more refined creations, or remain at infinite removes above the sphere of all terrestrial and celestial forms.

Of the doctrine intended to be conveyed in these remarks, a more distinct and enlarged understanding will be obtained as we proceed.

But, presuming that the reader already sufficiently comprehends the fundamental principles herein set forth, he is desired to bear constantly in mind, that the dynamic principles of the cosmical creation, were not *developed by* the creation itself, but *developed it*; and the same may be said of the vitalizing and moving elements of *all* degrees of material unfolding. The dynamic principles (constituting, indeed, what may, in the aggregate, be called the general Soul) are thus the immediate Cause of the outer development (or Body), which is the Effect.

And here it may be remarked, that if there is *any* relation between Cause and Effect, it must not only be a relation of *generals*, but of *particulars*; and thus the Cause must be a precise archetype of which the Effect is an antitype or embodied representative; and hence the two must, throughout, precisely correspond to each other. Every *degree* of creation, therefore, may be considered as a precise outer expression of the corresponding *degree* of Divine Love, Wisdom, and Energy which vitalizes and governs it, and in which it was previously contained as an archetype.

Moreover, these interior Divine dynamic principles, together with their prescribed *modes* of action, constitute the operative *laws* of nature. According to this view, while there is a *law* for every class of natural and even spiritual phenomena, and all things may be explained without a resort to *contra-natural* or *contra-legal* agencies, laws, on the other hand, are not those lifeless, unintellectual fatalities which they are represented to be in prevalent philosophies of the day, but they are the express modes of perpetual *Divine volition*. In looking, therefore, upon ~~this~~ universe, with all it contains, as *law-governed*, we may, at the same time, look upon it as *God-governed*. But on this point, more in its proper place.

If this view is correct, then there is, in reality, no necessary antagonism between materiality and spirituality, nature and heaven, reason and revelation, science and theology, but each may be regarded, when correctly understood, as the exponent of the other. Quite distinct, however, is this view from that gross speculation which makes of God nothing more than the ultimately sublimated and self-moving essences of the natural universe—a kind of universal hyper-galvanic battery which, by its perpetual and self-generating action, produces solar and planetary revolution, terrestrial changes, and those movements

in the refined essences of the human brain which constitute *Thoughts*. In our philosophy, God is God, and nature is nature—the two being eternally distinct, though intimately connected and co-related with each other.

CHAPTER IX.

DEFECTS OF PREVAILING COSMOLOGICAL THEORIES.

IF the foregoing theory of the origin, structure, dynamic agents, and laws, of the universe, has any foundation in truth, it can scarcely fail to throw important light upon some still ulterior questions relating to the prescribed distances, motions, reciprocal attractions, etc., of planetary and sidereal creations. It may even show that some time-honored theories upon these subjects, however sanctioned by the authority of great names, are, in certain particulars, radically defective; and this it will do, if at all, by transcending them in the ease, naturalness, and completeness with which it accounts for certain existing phenomena.

It was supposed by Sir Isaac Newton, that all rotatory and orbital motion of the heavenly bodies, originated from a *primary and external impulse* received from the hand of the Creator, as they were launched into space. To this was added the philosophical axiom, that any body put in motion *in a vacuum*, will continue forever to move in a straight line, unless deflected from its course by some other force. This deflecting force, as applied to the motions of the planets, Newton found in the law of *gravitation*, which was by him proved to apply to all planetary bodies. By the precisely counterbalancing action of these two forces, called the centrifugal and centripetal forces, the motions of the planets were supposed to be regulated in circular or elliptical orbits round the sun, the specific

distances of these being greater or less according to the nearness or remoteness of the point where these two forces were exactly balanced against each other.

But Newton soon found this theory, seemingly perfect in other respects, encumbered with difficulties in respect to the *stability* of the system. He found that the different planets were not only attracted by the sun, but mutually attracted by each other. These different attractions, varying in intensity in the inverse ratio of the squares of distances, according to a law discovered by Kepler, were accompanied by *perturbations*, producing irregularities in orbital motions which were subject to secular increase. The system, thus, left to its own internal provisions, seemed to prophesy its own progressive derangement, and its ultimate entire disorganization; and Newton felt impelled to call upon God to avert such a catastrophe, by supplying a force from *without*, which he supposed did not exist *within*, the system.

The calculations of subsequent mathematicians, however, served, in a good degree, to dispel these gloomy forebodings, and led to the conclusion that the irregularities and apparent incipient derangements in the motions of the system, would finally reach their maximum, after which there would be a gradual return to the condition of primeval equilibrium; that thence there would be a progressive tendency to irregularity in the *opposite* direction, to be succeeded by another reaction; and that the perpetual vibrations of these irregularities, like the oscillations of a mighty pendulum, would serve to mark the hours and moments of eternity!

This conception of the laws, internal arrangements, and movements, of the system, together with the apparent mathematical evidences which have been arrayed in its support, can not otherwise than be regarded as one of the greatest

triumphs of human genius. Yet, even while overwhelmed with a sense of its sublimity, one can not well suppress a sense of sadness as he contemplates its cold, mechanical lifelessness—I had almost said Godlessness! Contemplated in this light, the universe appears somewhat analogous to an ingeniously constructed machine, which is wound up, and left to go of itself, while its maker withholds all further exercise of power from it, and forever withdraws all immediate personal care over it, as being unnecessary. With this philosophy impressed upon our minds, we look up into the heavens, and, though we behold incessant motion and activity in every direction, we see no necessary evidence of immanent life or spirit—nothing with which our souls can sympathize as the present pervading *Animus* and constantly impelling Cause of the phenomena we behold; and it is only by an almost painful stretch of the powers of inductive reasoning, that we can attain to any substantial conviction of a spiritual or voluntative Cause, as having been connected with the system even at its *origin*!

It may be added, that thousands of persons, on arriving at a full comprehension and conviction of the truth of the Newtonian theory of a merely mechanical universe, and of *vacuity* in the interplanetary and interstellár spaces, have anxiously inquired, “Where and what, then, is that *spiritual world* to which our interior natures aspire, and for which Revelation encourages us to hope?” and nature, viewed in this aspect, has not only refused to respond in language which appeals to the conceptive and reasoning powers, but has interposed a cloud of darkness and doubt between the inquirer and the subject which he seeks to comprehend! In its efforts to satisfy the irrepressible yearnings of the spirit within, Fancy has erected a formless, unextended, unsubstantial—even unaerial—figment, that bears no relation to space or the material uni-

verse, or to any of the rational faculties of the soul; and in this mankind have been told to have *faith*, as the place or state of future human destination! But a *rational* faith in such an utter inconceivability is out of the question, and an *extra-rational* and mere dogmatic faith, in such an idea, can not generally, if ever, be kept free from superstition, and hence, from a greater or less degree of mental degradation and slavery. Hence, in case of full adoption of the Newtonian system of cosmogony, a determination to follow only the convictions of *reason* will necessarily tend to skepticism with reference to *spiritual*, and to some extent even with reference to *Divine* things; and there is no latent force in the theory which, by any development, can ever correct this mental aberration. In the spirit and tendency of this merely *mechanical* mode of philosophizing upon the universe, may, I apprehend, be found the main cause of the growing materialism and skepticism of these modern days, especially among minds called *scientific*.

Subjected to the test of rationality, however, the Newtonian system, in at least one of its features, seems to be almost as bad off as the only spiritual and theological theories that can be rationally associated with it. It predicates mutual gravitation of any two distant bodies, while it fails to recognize, if it does not, by implication, entirely preclude the idea of, any intervening gravitating agent. But that any two bodies can in any way act upon each other, either without immediate contact, or the intervention of some substantial medium by which they can touch each other, is utterly inconceivable, and can no more be supposed than any effect can be supposed to be disconnected with an adequate cause. We do not, however, charge the theory with *absolutely* and *necessarily* precluding such a medium; but by manifesting, at its very starting point,

such a strong inclination to the idea of absolute *vacuity* in the interplanetary spaces, it not only fails to provide such a medium, but, in effect, discountenances the idea that such exists. In the theory which we have maintained in the preceding pages, however, the medium in question is abundantly provided.

Moreover, the system as conceived by Newton can not, after all, be contemplated without some degree of apprehension in regard to its *safety*. For, notwithstanding the figurings of subsequent mathematicians respecting the reaction which tends to restore lost equilibrium, if we do away with the immediate immanence of Divine Vitality—in other words, with the immediate presence and agency of that *degree* of the Divine Essence and Power of which the universe forms a suitable habitation, and which is necessary to the life and functional operations of the latter as of one Body—then there are many chances against the existence of an *absolute equilibrium* in the different parts and forces of the great Whole: and if there is ever a disturbance of the equilibrium to an extent which can not be entirely restored by a counter oscillation, even though this be only the fraction of the weight of a planet, or even the amount of a single pound, the disturbance will progressively aggravate, and a universal catastrophe will be the final and inevitable result!

If, therefore, the stability of the universe depends merely upon the nice counterpoise of the centrifugal and centripetal forces, as independent of this constant Divine Force, and of any *elastic*, *active*, and *reactive* medium to keep the various celestial bodies within prescribed boundaries, then human reason can not withhold the suspicion of *danger* as it contemplates the stupendous Machine, or suppress the apprehension that it may one day fly to pieces, and involve us all in the

common wreck! This apprehension greatly increases, when it is considered that Newton's hypothesis of absolute vacuity in the spaces through which the celestial bodies move—an hypothesis upon which, according to him, the equilibrium between the centrifugal and centripetal forces necessarily depends—has proved unfounded, and that the phenomena of retardation of comets in their orbits, has proved that the interplanetary spaces are pervaded by an attenuated fluid or ether, capable of exerting some resistance to their progress.

It is here submitted, with all due deference to the superior intelligence of many who have never entertained a doubt of the entire truthfulness of Newton's theory, that that theory, at least without essential modifications, would probably never have been propounded by Newton, or adopted by others, had the theory of the nebular origin of the universe, with its accompanying evidences, and natural corollaries, been previously subjected to familiar contemplation.

We now proceed to briefly unfold a theory respecting the foregoing subjects, which, whatever may be its imperfections, seems to the writer, at least, much less encumbered with difficulties than the merely mechanical theory of Newton, while it is certainly more compatible with the idea of an immediate and universal Divine superintendence.

CHAPTER X.

GROUND'S OF STABILITY AND GENERAL ECONOMY OF THE COSMICAL STRUCTURE.

As a preliminary step toward a due comprehension and appreciation of the theory now to be offered respecting the internal forces, movements, grounds of stability, and general economy of the universe, the reader is requested to bear distinctly in mind that *principles* operate indifferently upon a large and a small scale—that the magnitudes and distances of the objects to which they apply, are absolutely of no consequence as affecting the essential nature of their operations.

Now, in the light of this truism, let us suppose some simple vegetable form—say an apple—to be placed under a microscope so exceedingly powerful as to magnify it to the apparent size of that immense spheroid of stellar orbs with their planets, which is known to us as the Milky Way, and in the midst of which our world is situated. We will suppose that the pores of the apple would, in that case, appear of a magnitude equally great with the interplanetary and interstellar spaces, and that the molecules would be magnified to the apparent size of worlds. Moreover, the internal motions of the molecules, observing the natural order of vegetative circulation and progression, would bear a certain resemblance to the rotatory and orbital motions of suns and planets, and all, obeying the law by which the distinct stratifications and compartments of the apple are formed, would give an appearance somewhat similar

to distinct systems, and systems of systems of suns and planets, as these are successively brought into the field of a telescope. Suppose, that after this optical arrangement is completed, some learned Newtonian astronomer, who is entirely ignorant of its nature, is invited, on some clear evening, to look through the instrument, which is represented to him as a newly invented *telescope*, instead of a *microscope*. The astronomer gazes with wonder and astonishment, and thinks he has obtained a new and favorable view of some stellar and planetary creation which has not before appeared to him exactly in the same aspect.

"Well, Mr. Astronomer," demands an inquirer, "what is your opinion respecting the origin of the motions, the laws of operation, and the source of stability, of the system which you are now surveying?"

"Why, undoubtedly," replies the astronomer, "the *same principles* are applicable here that apply to *all* planetary and stellar creations;" and if he added no more, he would thus far be correct. But he continues, "Undoubtedly each one of those bodies received a certain mechanical impulse as it was launched into space from the hand of the Creator. Each one moves in a *vacuum*, and would have continued its primitive motion in a *direct line* forever, had it not been deflected from its course by an equal and perpetually operative force of *gravitation*, whence its *present* motion is in a circular or elliptical orbit. If either one of those revolving bodies," continues the sage astronomer, "were arrested in its orbit, and the centrifugal force were thus destroyed, gravitation would immediately draw it to the central sun, and this would probably so derange the equilibrium of the system as to ultimately produce a universal catastrophe!"

If the astronomer is now shown a *direct* view of the real

subject of these speculations—is shown that it is merely an apple—he will consider this as of itself a sufficient refutation of his speculations, so far as *that* object was concerned; because he considers the internal molecular motions of the apple as being governed by a principle of *life*, and this he regards as of itself amply sufficient to keep up the equilibrium of its particular parts.

But each cluster, or firmament, of suns, with its planets, is, in *principle*, but an apple on a large scale. Some of the more distant, and less easily resolvable, nebulae, indeed, appear to a telescope of small power, almost in the identical form and size of an apple; and, viewed apart from all other considerations than those suggested by their own proper aspects, as the white, milky spots, which they present to telescopes incapable of resolving them, one might have easily conceived that they were agitated by internal motions; but the conception that these internal motions were referable to external and mechanical impulses, and that the moving bodies (which the distance of view reduces to molecules) were sustained in equilibrium by counter impulses, according to the Newtonian theory of planetary motion, would have been as unnatural and far-fetched, as would be precisely the same theory applied to the internal molecular motions of an apple.

Indeed, it is conceivable that one might be miraculously elevated above the whole plane of sidereal creations to a distance so great that, as he looked down upon the whole universe of firmaments, the *whole* might present one unresolved mass apparently, from that distance, no larger than the size of an apple. Now, when we remember that in the workings of *principles* there is absolutely no distinction made between great and small bodies, how naturally may it be supposed that the whole universe, with all its included sub-universes is per

vaded, like the apple, by an internal principle of *Life*, and that *this* is the cause of all its internal motions, and the sustainer of equilibrium among all its constituent orbs, which, to it, are in reality no more than what the molecules are to the apple!

But let us endeavor to obtain a more distinct view of some of the constituent elements embraced in this general theory: Our theory, before propounded, of constantly *emanative*, as well as constantly *gravitative*, forces as connected with planets, suns, systems, and firmaments, seems, if correct, to necessitate the conclusion that universal space is constantly *filled* with substance. This substance is in the solid, fluid, aeriform, and ethereal states. In its densest state, it may be supposed to be indefinitely more dense than the heaviest substances known upon earth, and in its rarest state, it may be supposed to be indefinitely more rare than electricity, and between these two extremes, there are probably all intermediates. The universe may thus be regarded as only *one* vast ethereal Body, having in its general mass innumerable points of condensation, which are suns, planets, etc.

Now, the force which originally induced nebulous circles, firmaments, suns, planets, satellites, etc., to assume their respective orbits at specific distances from their primaries, and which perpetually operates (with some modifications, according to different stages of progression) to keep these bodies in those general orbits after they are assumed, may, in a degree, be conceived by the following illustration: The *ponderable* atmosphere of the earth at a level with the sea, is relatively dense, while at the tops of the highest mountains it is relatively rare; and at an altitude of forty-five or fifty miles, according to received estimates, its existence ceases to be appreciable. Hydrogen gas is much lighter than the ponderable

terrestrial atmosphere at a level with the sea; and when confined in a balloon, it ascends, with its envelope, to an altitude determined by the degree of buoyancy of gas and balloon united, and there it floats until dissipated. Now, each solar and planetary body in space, is surrounded by a *calorific, luminous, electric, and ethereal* atmosphere, which, in like manner, varies in density and power with the distance from the center of condensation; and, by virtue of the respective super-aerial atmospheres of any two bodies sustaining to each other the relations of primary and secondary, the secondary body assumes an orbital distance from the primary, which, as in the case of the balloon, is governed by the law of equilibrium—which distance, however, is somewhat modified by centrifugal force.

This illustration of the balloon, however, is very imperfect, and only serves to enable the reader to *approximate* to a conception of the true idea; for we are not to consider any planet or other celestial body, as having the same degree of *affinity* for its primary as the balloon has for the earth, or as being attracted to it in exactly the same way, or as it would be, if there were no greater dissimilarity between its matter and the matter of the primary, than there is between the matter of the balloon and that of the earth. But each celestial body is composed of materials, and possesses calorific, electric, odic, and other forces and properties, and hence *affinities*, peculiar to itself, and which, in general, differ from those of any other given body in proportion to the distance of its natural situation. Moreover, each planet, sun, etc., as before intimated, is only the *condensed center* of a general *ethereal* body of no particularly defined circumference, but whose refined emanations, growing more rare with each remove from their centers, extend indefinitely into space. In this way, each body inter-

communicates with, and acts upon, all kindred bodies, and is acted upon by them in return; the action consisting in an interblending of the forces and properties of the different bodies. When this interblending is harmonious, the action is attractive; when it is conflicting, it is repulsive. Beyond certain limits of distance, the interblending actions of any two bodies, however dissimilar in constitution, is always harmonious—and hence attractive; *within* those limits of distance, the action is crowding and conflicting, and hence repellant.

Suppose, then, that by some controlling arm, or some accidental impediment, a planet were suddenly arrested in its orbit, and were thus relieved from the influence of centrifugal force: it would immediately be drawn toward its primary with a force which would uniformly increase as the square of the distance decreased, provided no counteracting force were developed by the approach to the central body. In falling inward, however, although the attractive force would, *for a time*, be increased (that is, until the previous centrifugal displacement was overcome), its elastic atmosphere would begin to crowd more and more upon the elastic atmosphere of the sun, and even its own solidified particles, by the increased calorific, photic, electric, odic, and vital action due to the proximity of the two bodies as centers of such action, would, in themselves, develop an emanative or repellent force in respect to the primary; and, owing to these causes, the secondary body could not approach within a certain distance of its primary, within which distance the repellent force would be *superior* to the attractive.

The same idea is involved in the theory (before propounded) of the process by which secondary bodies were formed from primaries—and which supposes that the secondaries are composed of an equal quantity of *attracted* and *emanated* particles.

As each *individual* of these, acted upon by centrifugal force, finds its equilibrium at the particular point where, by the union of all, the secondary body is formed, so the *united mass* of particles in the body thus formed, has no more tendency to *draw* nearer to the primary than it has to *emanate* further from it.

Suppose, then, any particular secondary body should be violently arrested in its orbit: it would evidently sink into the ethereal atmosphere of its primary a distance measured by its previous centrifugal displacement, which, in most cases, would be considerable; but at some point between its former orbit and the primary, it would attain to an exact equilibrium between the attractive and emanative or repellent influences, and there its inward motion would stop. If held there by violence, and prevented from partaking of the general vortical motion of the system, it would be to the *cosmical* system what a mass of displaced particles, or a splinter of foreign matter, would be to the *human* system; and the effect would be, an inflammation, suppuration, and dissolution, of the part. For, it is evident that in such a case the body would accumulate heat and other repellent elements from the primary, more rapidly than it could relieve itself of them, and sooner or later these accumulations would be beyond its powers of endurance. The particles in that case would separate in detail, and would either be digested and assimilated with the general mass of the primary and its atmosphere, or, assuming the general revolutionary motion of the system, would be again thrown outward by the resultant centrifugal force, and would reaggregate themselves at their original distance, and the planet would be formed anew.

For an explanation of the principles on which all rotatory and orbital motion may originate, the reader is referred to an earlier stage of this treatise, in which we spoke of the first

assumption of rotatory motion in the universal mass : and, by considering the universe still as one general Body, interiorly gravitating and emanating as in the beginning, he may conceive how these motions, not only of the great *general* Body, but of all its included and correspondent *sub*-bodies, is perpetually sustained by a constant supply of the same forces which operated in the beginning, and which constantly inflow from the inexhaustible sources of Divine Spiritual Heat and Light, which mean Love and Wisdom, and which constituted the Alpha and Omega, the first and the last, the beginning and the ending of this grand creative operation ! What can be a more natural thought than that the universe is constructed, and that all its functional operations are carried on, according to the foregoing principles ! and what hypothesis relating to this grand subject is so free from difficulties !

If the universe is actually constructed on these principles, it manifestly possesses (under the operations of its pervading Divine Life) a self-regulating power which must necessarily give it the utmost conceivable stability—the stability of an almost infinite living Organism, exempted from all external causes of death ! Let planets be crowded out of their orbits, if such a thing were possible (which it is not), and they will either spontaneously return again, or new arrangements will be assumed among their associate bodies, which will be according to the law of equilibrium, and equally harmonious with the previous condition. Let planets, or even whole systems, by any imaginable means, be stricken out of existence : there would be an immediate supplying of the vacuum—a healing up of the part—and scarcely a cicatrice would remain. In short, let the system, by some imagined foreign force, be wounded and deranged in almost any conceivable way : it would still contain an internal power of recuperation. But as a Divinely

constituted Fabric, destined to unspeakably noble and glorious ends, it is entirely free from all causes of material disturbance, and will live on until its highest purposes are fully attained, when, as one Grand Man, it will change its whole mode of being for one which is more spiritual, more Divine, and inconceivably more glorious!

CHAPTER XI.

PARTICULAR CONSIDERATIONS CONCERNING THE GENESIS AND MODUS OPERANDI OF THE SOLAR SYSTEM.

LITTLE more needs to be said, by way of applying the foregoing principles to the genesis and *modus operandi* of our own Solar System. It has been before intimated that the identical principles are involved here that were concerned in the origin and government of the universe, as a whole, with some modifications in the form of their results, as owing to differences of conditions, and that the seven-fold series is observed in the laws, operations, and successive stages of unfolding, in both instances. In both instances there are the successive and ascending degrees of Chaos, Nucleation, Spheroidation, Circular Agregation, Segregation, Secondary Spheroidation, and the complete and ultimate cosmical unfolding. In both cases the dynamic agents of Heat, Light, and Electricity, with their corresponding triad of odic elements are involved, to which, in both cases, is superadded the all-pervading and controlling Divine Life Principle.

The chief differences in the *specific forms* of developments in the two cases, lies between their fourth, fifth, sixth, and seyenth degrees. In the series of developments through which we have supposed the universe, as one whole Body, to have passed, we have supposed the *fourth* development to be that of *nebulous rings*, surrounding the primary spheroid—or, at least, segments of rings so large, and of such various parts, as

to preclude the possibility of an aggregation of the materials of either ring or segment, into *one* spheroidal body ; while, in the Solar System, the size and other conditions of each of these cycloidal nebulæ were, with apparently one exception, such as to admit of an aggregation into one spheroidal body. The exception here referred to relates to the mass of materials from which originated the asteroids. The *fifth* or *segregative* process in the *universal* development, consists, according to our hypothesis, of the division of each nebulous ring or segment, into a *multitude* of angular and indefinitely formed masses ; whereas the fifth and corresponding development in the *Solar System*, consisted (in every case except that of the asteroids, as before mentioned) simply of the breaking up of the nebulous ring, and the assemblage of its parts into *one* body. The processes of the sixth development, both of the Universe and of the Solar System, were perfectly identical, except that in the former case *solar* spheres, and in the latter, the gaseous and incandescent spheres of nascent planets, were the result. The *seventh* development of the universe consisted of the unfolding of the identical forms which were the product of the sixth development of the solar system, viz., the forms of nascent planets, as aforesaid ; whereas the *seventh* development of the solar system, consisted of the superficial solidification of those bodies, and such other changes in them as prepared them for the introduction of the first and lowest of the organic forms, by which they were subsequently tenanted.

But although the Universal System and the Solar System thus each consists of a complete octave of developments, each octave has its own particular key-note, which differs from that of the other. That is to say, they do not begin at the same place in the staff, nor does one begin where the other ends.

This, however, does not in any respect destroy the correspondence of the *principles* which both involve.

After the sun and planets were thus formed by agglomerations and condensations of the originally diffused mass of chaotic materials, there would naturally still remain in diffusion through the general sphere of the system, a quantity of mundane matter, so great as to be liable, under the further action of the law of condensation, to ultimately assume forms more or less distinctly visible. This consideration hints at the origin and character of those erratic, and in some cases apparently almost lawless bodies, called *comets*. These are mere *excrescences* upon the system—*incidents* of previous developments; and their anomalies of constitution and motions are probably the results of their borderings upon the extreme confines of the forces and laws provided for the government of the system. Aside from some illustrations of cosmical laws which they afford, they probably subserve no purpose which is much more important than that of the amusement of astronomers.

This idea of residual nebular matter also accounts for that singular nebulous and oblately spheroidal envelope of the sun, which is called the "Zodiacal Light." Probably neither the formation of this nor of the comets, was specifically contemplated in the original plan of the Creator, but the development of each was *incidental* to the uniform operations of established laws.

As originated our own solar system, so we may suppose originated all other solar systems in space, with differences in the *forms* of the operations and results of identical principles, according to differences in material conditions and local circumstances.

CHAPTER XII.

SYNTHETICAL VIEW OF THE ORIGIN OF THE EARTH, AND ITS GEOLOGICAL FORMATIONS.

THE last developed forms of the universal cosmical structure, viz., the distinctly segregated masses of planetary matter before described, may be viewed in the light of *Seed* of the great Tree of previous Being, and Germs of a future and corresponding creation. By means of a generative influence constantly descending from the Divine Spirit, as the Source of all subordinate existences, a corresponding octave of unfoldings now ensue, which may be called the *geognostic* unfoldings. The successive stages of these, which, like other systems of creation, form a *seven-fold series*, seem, both in the light of *principles* and *facts*, to observe the following order and relations:

PRIMARY TRINITY.

1. Chaotic or unformed fiery vapor.
2. Spheroidal nucleus (liquid and gaseous).
3. Granito-aqueous, or, superficially solidified and oceanic.

SECONDARY TRINITY.

4. The "Transition Period," characterized mainly by aerial developments and changes.
5. The "Secondary Period," characterized by distinctions of climates and seasons, and their corresponding sedimentary deposits.
6. The "Tertiary," or, the volcanic, lacustrine, fluvatile, and abrasive Period.

ULTIMATE.

7. Recent or Alluvial Period.

In our descending or analytical view of creation, we spoke briefly of some of the more superficial characteristics of these terrestrial developments; but we will now glance at the aspects in which they will appear in the light of the *a priori* and *a posteriori* processes of reasoning combined.

1. THE CHAOTIC STAGE.—In our analytical and analogical view of the terrestrial system, we found abundant reason to believe that our earth was formed from a mass of primeval fiery vapor, as expressing material conditions *antecedent* to the fiery *liquid* mass, of which, facts prove that our globe once consisted. Following the further and obvious teachings of analogy, as well as the intimations of certain celestial phenomena, we were led to the conclusion that this mass must have been a result of a previous aggregation and segregation of the materials of the solar atmosphere, of which an explanation is involved in the now apparently well-established theory of the formation of the nebulous rings, and their subsequent changes.

It seems to be a well-founded opinion of believers in the nebular theory, that the gaseous cycloid, whose condensation resulted in the formation of the earth, must have originally been nearly of the same shape and circumference with the present orbit of the earth. Now, the earth's orbit is not an exact circle, but an ellipse, with the sun in one of its foci. Consequently, at the separation of the materials of this ring or cycloid at one part of its rim, and their aggregation at the opposite part, whether this occurred at the perihelion or aphelion point—the common mass thus formed must have taken the elongated or ellipsoidal shape, and preserved superficially all the general geometrical properties of the previous circumsolar zone, on a reduced scale.

The first distinct form assumed by the materials of our

nascent planet, therefore, must have been that of an ellipsoid, or, perhaps, more properly speaking, that of an egg somewhat flattened in the direction of its shorter diameter. The *two ends* of this ellipsoidal body, preserving, respectively, the general qualities of what were its aphelion and perihelion points when, during its previous and higher state of diffusion, it encircled the sun, must now sustain toward each other the relations of *positive* and *negative*.^{*} The atoms having the strongest affinity for the positive influence, therefore, would naturally flow toward the positive end; and those having the strongest affinity for the negative influence would flow toward the negative end. There would, therefore, be a tendency of the particles to agglomerate and condense in the form of a separate nucleus near *either end* of the general body, or, more accurately speaking, probably in either *focus* of the ellipse. If the particles are sufficiently diverse from each other as to their extreme degrees of positiveness or negativeness, and other circumstances are favorable, the tendencies to agglomeration and condensation at these two points, may result in the formation of a primary planet and a satellite; or, if there are several degrees of matter widely distinguished by their relatively positive and negative qualities, a correspondingly complicated operation of the same principles and forces, may result in the formation of *several* satellites.

The idea of a tendency to, and condensation in, the foci of the egg-shaped nebulous mass, thus forming a primary and a satellite, and that this tendency indicates a *law*, is in precise

^{*} In employing the terms "positive" and "negative," as above, it is not intended to restrict the idea of the polar relations which they express, to a connection with electricity or magnetism. These relations may be supposed, in some sense, to subsist between the two extremes in the development of *each* of the Imponderables. Reichenbach, as we have seen, found unmistakable indications of these polar relations existing in the "odlic" element, with its different varieties, by him discovered.

accordance with, and explains, the fact, universal in the solar system, and doubtless in other departments of the cosmical creation, that when bodies (whether planets or satellites) revolve in *elliptical* orbits, their primaries, or centers of gravity, are invariably situated in one of the foci of the ellipse, precisely where, according to our theory, such bodies must, in all probability, have been originally formed. It may be added that, of the fact of this *focal*ity in the situation of primaries with reference to the elliptic orbits of their secondaries, no other hypothesis than the general one now under consideration affords the slightest explanation.

Considering the earth and the moon as having, in this way, been formed respectively by condensations in the foci of the same original nebulous mass, their origin and relations may be considered as hinting at, if not exactly representing, the origin and relations of the two bodies of what are called *double stars*, or binary systems. The *diversity of colors* generally observed as characterizing the two constituents of such systems—the larger body being, in most cases, relatively red, and the smaller relatively blue, as though they had divided the prismatic colors between them—strongly intimates, of itself, something like a *polar opposition* in the materials of which they are respectively composed, and gives additional weight to the hypothesis of their original and nebulous connection.

The hypothesis of an original union in one nebulous body of the materials of the earth and moon, seems, indeed, to be necessary, if there is admitted to be *any* truth in the nebular theory. But, if this hypothesis is true, it suggests a connection of a nature heretofore little suspected, as even *now* subsisting between the earth and moon. Taken in connection with our doctrine of constant *emanation*, as well as constant *gravitation*, of particles governed by the laws of *assimilation*,

elimination, and polarization, it encourages, if possible, even more than a suspicion, that the earth and moon are but condensed and oppositely polarized points in one common mass of ethereal, magnetoid, or "odic" substance. Such an ethereal mass, considered as the common calorific, photic, electric, odic, nervoid, and vital sphere or atmosphere of the earth and moon, would seem to be a necessary existence, according to principles involved in the discoveries of Reichenbach; while, on the other hand, and in a still more emphatic sense, the earth and moon in their present state, may be supposed to consist of *precipitated particles* originally held in solution in their now enveloping ethereal and imponderable menstruum.*

This field or realm of segregated ether supporting these now condensed points, may, in its present state, be considered as an ultimate refinement of the primeval nebulous mass from which our world and its satellite had their common origin. Though its ultimate attenuations, intercommingling with those of kindred bodies (yet still preserving their identity) may be supposed to extend indefinitely into space, the relatively dense,

* It is well known that particular positions of the moon in respect to the earth, are accompanied with marked effects upon somnambulists, cataleptics, and persons disposed to insanity; and it has from time immemorial been believed that certain lunar positions have also a decided influence upon the vegetable and animal kingdoms. During eclipses of the sun, when the moon has been directly between that luminary and the earth, hungry animals have been observed to suddenly cease eating, and become apparently sad and dejected; and when eclipses have been total, birds have sometimes been known to fall dead from their perches. Now, neither of these effects can be supposed to result from any modification of the force of *gravitation* as owing to the relative positions in such cases, of the earth, moon, and sun. But if we suppose, as is supposed above, that the earth and moon are enveloped in a common "odic" sphere of a nervoid and semi-vital character, and that this changes in its polar relations and consequent qualities of influence upon living organisms, with every change of relative position of the earth, moon, and sun, we have an easy solution of the phenomena in question. The supposition of such a change of influence would seem to be countenanced by the results of Reichenbach's experiment with the revolving magnet, before spoken of.

or the rationally more obvious, portion of the body, still retains, in all probability, the general shape and size of the original nebula. If we suppose this spheroid of imponderable matter to be rotating on its own proper axis once in twenty-seven days, seven hours, and forty-three minutes, carrying the earth and moon with it as its *condensed foci*, we have, in such supposition, an explanation of the motion of the moon round the earth as it appears to us, and of the motion of the earth around the moon as it would be *mathematically* evident to an inhabitant of the latter body. If this supposition is correct, then neither body ought to move round the other as an absolutely fixed point in the system, but both ought to revolve around a *common center*—the axis of their common ethereal and enveloping mass. But, considering the superior attractive force of the earth over the moon, together with the superior density of that *whole end* of the ethereal mass in which the earth is situated, to that of the end in which the moon is situated, this center of common revolution can probably vary at most but a few hundred miles from the center of the earth, and may be very nearly coincident with it.

I believe that astronomers are now pretty generally convinced that in binary stellar systems, one body not only revolves around the other, but that the two bodies revolve round a *common center*, situated somewhere between the centers of the two, and nearest to the center of the larger one; and to these motions, those of the *binary* system of the earth and moon would, according to the foregoing hypothesis, present an exact analogy.

The earth, being the *major* or *positive* focal condensation of the general ethereal and enveloping spheroid, has assumed sufficient independence to admit of a diurnal revolution on its own proper axes; but the moon, being the *minor* and *nega-*

tive focus, still continues in subjection to the force of the *general ethereal* mass which is *positive* over it; and therefore, keeping the same side always to the earth, it rotates only with the rotation of the general mass.

If our hypothesis is correct, then not only ought the sides of the moon turned to and from the earth, to be in opposite polar relations, but there should be a slight *elongation* of the moon in the same direction, presenting, in fact, the dwindled and miniature form of the original nebulous or present ethereal spheroid. On the same principle there must have been a tendency to elongation in the form of the earth, while the particles which compose it were in process of aggregation. This tendency, however, so far as the *solid*, or *less mobile* materials of the earth are concerned, was corrected by its *rotation* on its axis, by the perpetual action of which, during the period in which the earth passed from a fluid to a superficially solid state, the surface of the earth was rolled into general rotundity. But the mobility of the *watery* portions of the earth's surface, was such as to preserve, in a degree, their freedom to observe the original tendency to ellipticity, *which tendency is now manifested in the form of tides*. For tides are only elongations of the *mobile* portions of the earth's substance, in what we have supposed to be the direction of the longer axis of the ethereal spheroid, which axis would necessarily be in the direction of the earth and moon, admitting these bodies, as points of condensation in the general body, to occupy generally the two foci of the latter. There are, doubtless, for the same reasons, *atmospheric* tides which are greater than the oceanic tides in proportion to the greater mobility of the atmospheric particles; and had not the earth assumed a rotatory motion (from causes identical with those which produced a similar motion in other bodies, and which

have been before explained), it would doubtless have condensed (as we have supposed the moon to have done), in a permanently oval form, whose opposite ends would, if the expression may be allowed, have represented *solidified* tides.*

With the evolutions and condensations above supposed, or, at least, with something not essentially differing from them, the materials of which our earth is composed, may be supposed to have passed out of their first or chaotic state.

2. The SECOND stage of the earth's developments, as obviously the next orderly stage of progression from the first, was that of a *spheroidal igneous nucleus*. This stage, indeed, commenced the moment the nucleus began to appear; for then the general body, by the *distinction* developed in its parts, began to pass out of the state of absolute chaos. It may be considered that this development closed when the outer limits of this igneous nucleus became *distinctly defined*, and when its merely molten and fluid substance became fully distinguished from its gaseous envelope.†

3. The THIRD stage may be denominated the *granito-aqueous*, it being the stage characterized by the formation of the first granite crust, and by the development of the oceans by which the latter was generally covered. This, completing as it did the first Trinity of terrestrial developments, brought the earth from a previously elastic and yielding, to a solid and perma-

* These suggestions, tending, as they do, to an essential modification of the Newtonian theory of tides, might be greatly fortified by additional considerations; but to present these in their proper force, discussions would be required which would be too occult for a popular treatise.

† The foregoing considerations in respect to the first and second stages of the earth's formation, are admitted to be mainly *a priori*, but to those who can perceive effects as involved in their causes, they will not be without weight. In respect to the remaining stages of development, we will not only have the evidence of *causes*, but of their *effects*, as still *observable* in the earth's crust.

ment state, and thus completed its constitution merely as a *planetary body*.

4. The **FOURTH** stage was characterized mainly by aerial developments and changes. It embraces that vast period during which the rocks of the Cambrian, Silurian, Old Red Sandstone, and Carboniferous systems were formed. At the commencement of this period, the atmosphere must of necessity have been in an exceedingly crude and impure state. Besides other gross and noxious elements, it must have borne in its bosom all, or nearly all, of the carbonic acid gas which subsequently became condensed in the mountain limestone and various other limestone deposits, and the carbon of which, parting with its oxygen, became embodied in the immense beds of mineral coal, found, more or less, in almost every quarter of the earth. An atmosphere thus surcharged with this noxious vapor, must have been incompatible with the existence of any forms of organic life, except those of a low order; and accordingly we find that the plants and animals of this vast period were, as shown by their fossil remains, exclusively such as inhabited the ocean and the marshy and frequently submerged places in its vicinity—situations intermediate between the properly marine and the properly terrestrial.

It was, doubtless, owing mainly, if not wholly, to atmospheric causes that the solar rays during this period had but little influence upon the surface of the earth, and that a nearly uniform temperature prevailed at all latitudes and at all seasons. Geologists have usually attempted to account for the high degree and general uniformity of this temperature, as indicated by the universally tropical nature of the plants and animals of this period, by referring it to a radiation of the internal heat of the earth, which it is supposed must, at that early period, have been much more intense than in subsequent

times. But the mystery seems to be quite as well, if not better, accounted for in the consideration that while the atmosphere was so excessively dense as it must have been while loaded with so much carbon and carbonic acid, *its pressure* must have been correspondingly great; and it is well known that every increase of atmospheric pressure is attended with an increase of heat. It is not improbable, however, that both of these causes had something to do in the production of the superior heat of these times.

The scene which would have been presented to a human spectator, could such an one have been placed upon the surface of the earth at this time, would have been gloomy and cheerless in the extreme. He would probably at no time have beheld either clouds or decided sunshine, but a dim and undefined luminescence, caused by the sunbeams in passing athwart the thick and stagnant atmosphere. No star-beam could have penetrated the dense aerial envelope to relieve the gloom of night; and, for the same reason, the range of horizontal vision, even at noonday, must have been confined within narrow limits. All diversity of landscape must, in the earlier part of this period, have been merged in one wide waste of waters. This, however, was, in later times, partially relieved by extensive districts of low, marshy land, on which the soft and succulent vegetation grew with the rankest luxuriance. No bird yet winged the air, or gladdened the forest with its song; no beast prowled through the thick jungles of fern and sigillaria, and no herds lowed upon the fields of moss and equisetæ; and, except the rolling of the ocean waves, the plashing of the finny tribe, and the occasional rumblings of subterranean fires, the most profound and gloomy silence reigned over the face of the globe!

If, therefore, in the first stage of the first Trinity of devel-

opments, the whole mass of *terrestrial* materials was in a state that may be designated as chaotic, we find here, in the first stage of the second Trinity, a corresponding condition as relating to the whole mass of *atmospheric* materials, and of its accompanying developments as the initial steps of terrestrial organic creation. Taken as a whole, however, the changes of this period brought conditions on the earth's surface into something like a systematic, or what may be called rudimentally organized, form.

5. The FIFTH development was characterized by distinction of climates as prevailing in different latitudes, and by warm and cold seasons, as owing to the revolution of our planet around the sun; hence, also, by new kinds of geological deposits, and higher degrees of organic life. This development was comprised in the period commencing with the New Red Sandstone, and ending with the close of the Chalk formation.

The records of the general conditions of this period are very distinctly preserved upon the leaves of the rocky book. On the laminæ of the New Red Sandstone rocks in various localities (and especially in the valley of the Connecticut River), are found the distinct footprints of birds of various species. These appear to have been impressed upon the sandy and clayey margin of an ocean at low tide, and to have been covered up by successive thin layers of sand and clay drifted in by the swelling tide. On the same rocks occur marks whose angles and other characteristics clearly prove them to have been made by *frost*. They are in form exactly identical with those which are now produced by frost in the mud upon the borders of a stream. These appear to have been covered over and preserved, in like manner with the tracks, by the detritus swept in by the returning tide. But it is noteworthy that, although these tracks and frost marks occur in abundance

above and below each other in the same system of rocks, *the two are never found upon the same lamina*—as though the birds, during the *frosty season*, were entirely absent, having migrated to a *warmer climate*, to return again with the *return of summer*.

On the same strata are also sometimes found impressions which could only have been made by the pattering of rain-drops during the passage of a small shower-cloud; and the forms of these sometimes even infallibly indicate the course in which the *wind* was blowing at the time!

Here, then, is the earliest distinct indication of the prevalence of atmospheric conditions somewhat similar to those which *now* obtain upon the earth's surface. We find, here, unmistakable evidences of summer and winter, warm and cold latitudes, rain, winds, clouds, and sunshine—conditions which clearly could not have existed to any great extent, during any previous period.

Concerning the relics of the olden time, from which these atmospheric and terrestrial conditions are inferred, Professor Hitchcock (to whom the scientific world is much indebted for bringing them to light) remarks: "It is a most interesting thought, that while millions of men, who have striven hard to transmit some trace of their existence to future generations, have sunk into utter oblivion, the simple footsteps of animals that existed thousands, nay, tens of thousands, of years ago, should remain as fresh and distinct as if yesterday impressed, even though nearly every other vestige of their existence has vanished. Nay, still more strange is it, that even the pattering of a shower at that distant period, should have left marks equally distinct, and registered with infallible certainty the direction of the wind."*

* Hitchcock's *Geology*, p. 155.

The terrestrial animals of this period were almost exclusively oviparous, partaking largely of the sauroidal, or lizard-like type, which latter remark is even applicable to the birds. Toward the closer of the period, however, an animal appeared, which may be regarded as a transition link between the oviparous and viviparous. It was an animal of the class Marsupialia; in other words, an animal with a pouch, like that of the opossum, or kangaroo, in which it sheltered and nourished its young for a season after their birth, the same being yet too feeble and imperfectly developed to endure exposure to the outer elements. It has hence been remarked that, "though the young of this animal were born alive, they were only *half* born, as it were," and needed a kind of supplementary gestation to fit them for life in the external world.

Like the fifth development or member of every other seven-fold series, therefore, *this* is characterized by the assumption of *distinctness*, or partition, in forms and gradations of forms, from a state of previous and comparative *indistinctness*. The *principle of segregation* is here distinctly observed, the same as it was in the fifth stage of the *universal* creation. Each one of these forms, being yet transitional and incomplete, is, as it were, a nucleated point in the previously chaotic materials and their involved principles; and therefore the whole development, being the second of the Secondary Trinity, has a certain correspondence to the second of the Primary Trinity, which was characterized by a *nucleation* of the materials of the earth as a whole.

6. The sixth stage of the earth's formation was comprised in the whole period commonly termed the Tertiary and Diluvial periods. It commenced immediately after that remarkable marine, terrestrial, and atmospheric change which must

necessarily have accompanied the great Chalk formation, and closed immediately prior to the commencement of the present or Alluvial period. It was distinguished from the previous stage of terrestrial developments, mainly by its lacustrine, volcanic, and fluvatile conditions, and by the erosive, leveling, and harmonizing operations which, especially near the close of the period, occurred on the earth's surface. These conditions were evidently an improvement upon previous ones. The earth became more extensively diversified by mountains and valleys, forests, fields, and running streams. The quantity of upland and fertile soil was greatly increased; the atmosphere was freed from previous pestilential vapors; the climates were rendered more salubrious, and all things were more compatible with the existence of higher species in the organic kingdoms. Accordingly, even in the lower strata of this formation, there are found the remains of animals of decidedly mammiferous species. These are of the order *Pachydermata* (thick-skinned), and of comparatively low organization. But as conditions advanced and new strata were deposited, higher species successively made their appearance, organic life all the while assuming more analogy to existing types, until, toward the close of the period, there was, in many instances, an actual shading off into species which now inhabit the earth. This latter remark is equally applicable to the vegetable, as it is to the animal, kingdom.

About the close of this period, there appears to have been a remarkable fall of atmospheric temperature, accompanied by a submergence of the greater portion of land in the northern and temperate regions, in seas filled with floating icebergs. These icebergs, frequently reaching to the bottom of the ocean, have scraped along over the earth's surface, clashed violently against its prominences, torn fragments of

rock from their original beds, pushed them along before them, the friction rounding off their angles, and reducing many of them to sand and pebbles. Sometimes large masses of rock would get wedged in between, or thrown upon the tops of, blocks or projections of ice, and would be floated to great distances and scattered over the country. Boulder rocks which must have been transported in some such way, have been identified with rocks "in place" to which they must have originally belonged, from a few hundred yards to several hundred miles to the north of where they were found. Sometimes boulders of great magnitude have been carried over steep and high mountains, and are not unfrequently found lodged upon their summits and scattered over their southern declivities; and the long-continued passage of rocky fragments and detritus transported in this way, has worn scratches, and sometimes deep grooves in the mountain rock, all of which have the same general direction, which is nearly north and south—proving that such was the general direction of the current. By this operation, which was evidently long-continued, rugged mountain escarpments were reduced; deep hollows were filled up, and the face of Nature was made to assume fairer proportions. In short, the terrestrial structure being generally completed, this final operation (to illustrate a great thing by a diminutive comparison) seems to have been the *smoothing* and *sand-papering* process to which it was subjected, before being applied to its ultimate and principal use as the habitation of its future tenant, MAN.

This superficial smoothing and rounding of the earth, and its completion as a *habitable globe*, being the third member of the Secondary Trinity of terrestrial developments, manifestly bears a certain correspondence to the third member of the Primary Trinity, or the granito-aqueous development, which

brought the earth to completeness, considered merely as a *planetary sphere*.

7. The SEVENTH terrestrial development, which now ensues, is that which is going on at the present time. It is characterized by sedimentary deposits from existing waters, and by the oceanic, terrestrial, and atmospheric changes which are now imperceptibly going on; and its ushering in was accompanied by the introduction of MAN, together with most of the animals and plants of existing species. This, therefore, is the grand culminating point of all terrestrial creations, and brings the seven-fold progressive series to a completion. It is the grand point that was aimed at in the beginning of beginnings, and the great object the accomplishment of which each intermediate movement was intended to subserve; and now that it is attained, the previous conflicts of elements—the clashings of an impetuous nature, as if reaching forward and striving impatiently for the attainment of its final destiny, are lulled into repose. The heavings of the earthquake and the spoutings of subterranean fire through the broken strata which were so devastating in previous ages, have now in a great measure subsided, or occur only in limited districts and at long intervals. Mountain and plain, forest and field, ocean and atmosphere now testify their common satisfaction with the end which has been gloriously achieved; and man, undisturbed, proceeds to beautify and adorn the earth, and, with no other interruptions than such as are due to his own folly, pursues his rounds of progress toward a destiny still more glorious and sublime!

Of course the foregoing remarks in reference to the genesis of the earth, are to be considered only in the light of a *general survey* of the subject to which they relate, and as being intended merely to establish general principles and

analogies to be used as aids in discovering or confirming ulterior and corresponding truths. Such being our main object, we have abstained from descriptions of non-essential minutiae which may be found in the geological books. We have, however, recognized all facts which have any essential bearing on the subject of our speculations, and by the aid of these facts, and of the general laws of causation and analogy which govern them, and necessarily connect them with corresponding antecedents and sequences, we have *inferred* the general nature of those necessary links of the system which are lost to sensuous perception. Hence we have commenced with descriptions of conditions far more primitive than those from which geological writers in general have started, and by the aid of the correspondences existing between one system of developments and another, as exhibited in the law of the seven-fold series, we have endeavored to exhibit the roots of the tree of Geology as growing upon the soil of Astronomy.

If the whole subject, as thus unfolded, exhibits a self-supporting and self-proving consistency, it in no small degree tends to establish the correctness and importance of the method of reasoning from which it receives its support.

CHAPTER XIII.

THE GEOLOGICAL AND MOSAIC REVELATIONS.

ONE of the first thoughts which strikes the mind as it contemplates the foregoing view of the natural history of our planet is, that the developments spoken of could have been accomplished only in periods too vast for human conception. Admitting that the process of unfolding which finally resulted in bringing our globe to its present habitable and mature state, commenced when its materials were all in a state of diffused igneous gas, it is utterly beyond the power of man to conceive the period which must thence have elapsed before these materials were so far contracted as to admit of the first superficial granitic incrustation. But after these untold myriads of ages had quietly rolled into the depths of the past, sedimentary materials, which, according to statements of Dr. John Pye Smith, as the results of careful measurements, must have had an aggregate thickness of *not less* than twenty miles, took place, for the most part quietly, at the bottom of the ocean. These materials, including the remains of plants and animals of now extinct species, and whole races of which were successively brought into being and swept away, were afterward slowly consolidated into the form of the existing fossiliferous rocks.

As to the number of years or centuries which must have elapsed during this mighty operation, we have the means of

making, in our calculations, only a remote and indefinite approximation. During comparatively short periods of violent physical revolution, conglomerates and other coarse and indistinctly stratified rocks may, in some instances, have been deposited with comparative rapidity. Older rocks were probably disintegrated by the combined agency of heat and water, and ground to fragments by volcanic and marine agitation; and, by violent currents, probably thus generated, they may have been carried to lower levels, and sometimes formed thick deposits in comparatively short periods. But these instances are only exceptions to the general rule, while far the greater proportion of the stratified rocks present unmistakable evidence of having been deposited in quiet waters. And these deposits could not, in general, have accumulated much more rapidly than similar ones which are going on at the present time. Now, it is said that the lakes of Scotland shoal, by sedimentary depositions, only at the rate of about six inches in a century.* Making all reasonable allowance for the superior activity of early disintegrating and depositing forces, the period which must have been consumed during the deposition of materials which have formed rocks of twenty miles in perpendicular thickness, can be estimated only by millions of years, especially when we take into account the long periods of super-marine elevation and repose which sometimes must have intervened between the close of one formation and the commencement of the succeeding one.

Our conception of the immensity of the periods of these deposits is augmented when we consider that beds of rocks of great thickness, and sometimes whole mountains, many thousand feet high, are made up almost entirely of sea-shells and other organic matter—these mountains having originally

* Hitchcock's Geology, p. 168.

constituted the sea-beds, from which position they were subsequently elevated by subterranean forces. The animals and plants, whose remains are thus preserved, "must have lived and died" (says Professor Hitchcock) "on or near the spot where they are found; while it was only now and then that there was current enough to drift them any considerable distance, or break them into fragments; * * * and frequently all the shells found in a layer of rock, lie in the same position which similar shells now assume upon the bottom of ponds, lakes, and the ocean; that is, with a particular part of the shell uppermost."*

Nor will we be astonished at these evidences of the high antiquity of our globe, when we consider the immense periods which seem to be consumed in its appointed movements in space. For if there is any dependence to be placed upon the observations and mathematical reasonings of Maedler and others, the whole solar system is rapidly moving around a remote center, in an orbit so vast, that a single revolution can not be accomplished in less than eighteen millions of years! Considering this period as the *annus magnus*, or great year of our planet and the family of orbs to which it belongs, it may have accomplished several of these grand revolutions since it assumed an individual existence, and still be only in the *first years* of its existence—an existence which may continue through as many such revolutions as there are days or hours in the ordinary life of man! In fact, in the development of the plans of an infinite God, who has a whole eternity as his working period, it may emphatically be said, that "a thousand years are but as one day."

But these wonderful deductions from scientific facts have

* Hitchcock's Geology, p. 88, 90; also, Silliman's Appendix to Bakewell's Geology, p. 544.

given alarm to many theologians, who have considered them as conflicting with the Mosaic account of creation, as recorded in the first chapter of Genesis. This account has by them been considered as circumscribing the period of creation to six literal days, during which it is supposed, that not only the earth and all it contains, but the sun and planets, if not even the fixed stars, were brought into being. They have hence looked upon the statements and speculations of geologists with disfavor, supposing that their tendency was to undermine the authority of the Bible. The present treatise, therefore, would be incomplete were I pass over entirely unnoticed the question pending between geologists and theologians. This question, however, I can now only consider in brief, exhibiting merely the general aspects of the controversy as they appear to me.

But before entering directly into the merits of the question, I would premise that all truths must be consistent with each other, whether found in the Bible or in Nature. If, therefore, there is any conflict unmistakably manifest between the teachings of these two authorities, it inevitably follows that one or the other must be untrue; and the untruth is most rationally predicable of that which is most liable to be tinctured by human invention.

Now, the system of creation, though subjective and phenomenal when considered in relation to God, is positive and independent when considered in relation to man. The pages of the rocky book were inscribed by no human amanuensis, and contain none of the whims and errors of perverted human thought. When *correctly interpreted*, therefore, they are to be relied on as infallible, and no theological teachings which contradict them can be considered as the teachings of the same God who wrote those imperishable pages with his own

hand. This consideration forces the conclusion, however reluctant we may be to admit it, that that system of theology which can be thrown into a trepidation by the unfolding of a fact in nature, and which, in any case, treats with hostility, or even with disrespect, the positive deductions of science, can not, thus far, have any counterpart in the mind of that Being who is the Author alike of nature and of heaven, and of the one harmonious system of truth which, in various and corresponding degrees, pervades and constitutes the life and law of all things.

True theology, therefore, has no more favors to ask of true science, than the latter has to ask of the former. Neither one of these, in any case, is alarmed by, but always rejoices in, any additional development in the other, because the two are brothers in affectionate unity, and each one contributes to the other of its own riches and strength, and neither can languish without weakening the other in a corresponding degree.

Some theologians, desirous of maintaining their preconceived interpretations of the first chapter in Genesis, have argued, that since it is possible for God to do all things, it was possible for him, with a single stroke of his omnipotent power, to create the myriads of sea-shells, the impressions of plants, and the skeletons of the higher animals, in their progressive order of superposition, in the rocks, just as we now find them! This might be admitted, if it could first be conceived as possible for God to have had a previous *will* and *purpose* in the generation of forms which, in such a case, would have been, to human conceptions, so *evidently useless*;—and so, with the same qualification, it may be admitted that God *might* have created Herculaneum under the beds of lava, and the Egyptian mummies in their tombs, just as we now find *them*.:—but to consider it in the least degree probable

that God actually did do either of these things, would be to set all analogy at defiance, and to take an everlasting leave of those guides to truth to which the human mind is largely indebted for all of its substantial progress. If, however, we abstain from such a violation of the *God-established* laws of our rational nature, we must admit in their full force the manifest indications of fossilology and lithology, in reference to the immense periods which must have elapsed during the genesis of our globe, and of the various and successive races of living organisms by which it was tenanted prior to the introduction of man.

Having the utmost confidence in the inherent strength and invulnerability of *true* theology, therefore, we affirm, without any delicacy or evasion, that if the six days of creation, spoken of by Moses, mean only six times twenty-four hours of our time, then the chronology of the stages of creation, as given by him, is manifestly untrue. But with a perfect willingness to find the account, true or untrue, as the case may be, let us examine the account *fearlessly* and without reserve, and endeavor to discover its real import.

In order to do justice in our interpretation of any writer's language, we must, of course, have a due regard to the meaning which context, the nature of the subject, the circumstances, objects, and personal condition, of the writer, and the modes of speech prevalent among the class of writers to which he belongs, conspire to fix upon his language. This rule is so obviously true, that no candid mind will fail to recognize its propriety at once. Now, the book of Genesis (as is the case with other books of the Bible) was written in an age and a country in which *symbolical* language was much in vogue. It also claims, like other sacred books, to have been written by a spiritually illuminated person, and for spiritual purposes;

and, admitting these claims, its peculiar forms of thought and expression must be admitted to have been governed, to some extent, by *spiritual laws*; and according to these same laws, therefore, they must be interpreted. Now, one way, and, in some instances, the only feasible way, of conveying in human language a deep interior idea is, by presenting it in the verbal imagery of some familiar exterior fact, which embraces within itself the *identical principle* which is involved in such interior idea. That this rule was observed in all the parabolic, and much of the prophetic and descriptive language of the Bible, no one who is familiar with the contents of that book can deny.

Now, let it be observed, that if Moses himself, through spiritual or Divine impressions, or any other means, had possessed any adequate idea of the immense periods which Geology proves to have elapsed between the commencement of the creation of our globe and the introduction of man upon its surface, it would have been impossible for him to have conveyed to the unenlightened minds of the semi-barbarians of his age and nation any adequate idea of the actual truth of the case; and any attempt to do this, would only have been productive of misapprehension, and would probably have generated some of the wildest forms of superstition. The probability is, however, that Moses himself had no adequate conception of the immensity of the actual periods of creation; and considering him, according to his claims, as a revelator merely of what was revealed to him, this admission may be made without affecting the truthfulness of the representations which were by him recorded as he himself received them.

These considerations strongly favor the belief, even *a priori*, that *any truthful* record of the natural history of creation made in those days, and especially for spiritual purposes, and

by a spiritual teacher, would have been couched in correspondent and spiritual language, by which the principles and spirit of the immense truths more interiorly involved, were brought into a diminished form of embodiment, and thus adapted to the rudimentary intellects to which they were addressed. Now, a "day" involves the *principle* of, and hence spiritually means, *one complete revolution*. But as each complete revolution, whether requiring a long or short period, only involves the *same* principle or spirit, why may not the great revolutions or cycles of operation which comprise the different periods in our earth's physical history be, in spiritual language, called so many days?

That the word "day" is, in the first chapter of Genesis, used in this spiritual sense, without necessarily signifying any thing but the *principle* or *spirit* of a day (or a complete revolution of indefinite duration), is further evident from the manner in which the word is used in many other passages, not only by Moses, but by other sacred writers. Thus we read in Genesis ii. 4, 5, "These are the generations of the heavens and the earth when they were created, in **THE DAY** that the Lord God made the earth and the heavens, and every plant of the field," etc. Here the six minor revolutions or days are comprised in one grand revolution or day, in the same way as several small circles or periods may be comprehended in one large one. The occurrence of the word "day" in this enlarged sense here, effectually precludes the right of every one to circumscribe its meaning necessarily to a period of twenty-four hours, as it occurs in the previous chapter in reference to the same subject.

Among the numerous other examples of a similar usage of the term "day," which may be found in other portions of the sacred writings, let the following suffice for our present purpose: "And in that *day* there shall be a root of Jesse which

shall stand as an ensign of the people; to it shall the Gentiles seek: and his rest shall be glorious. And it shall come to pass in that DAY, that the Lord shall set His hand again a second time to recover the remnant of His people." (Isa. xl. 10, 11.) "And it shall come to pass in that DAY, that the mountains shall drop down new wine, and the hills shall flow with milk." (Joel iii. 18.) And Jesus says, "Abraham rejoiced to see my DAY; and he saw it, and was glad." (John viii. 56.) In neither of these passages is it possible to restrict the meaning of the word "day" to the period of the diurnal revolution of the earth. In *candor*, therefore, it must be acknowledged to be at least extremely probable that the word "day" is used in an equally enlarged and spiritual sense in the equally spiritual language of the first chapter of Genesis—especially as there are so many other facts and circumstances to corroborate such an interpretation.

Considering the six days of creation, then, as expressing six periods of very long duration, let us inquire whether the incidents and characteristics of these periods as described by Moses, bear any similarity to the incidents in the physical history of our globe, as revealed by geological science; and whether the Mosaic classification of periods and operations possesses that evidence of truthfulness which consists in a conformity to the law of the three-fold and seven-fold correspondential series.

In a previous general survey, ranging from the origin to the full maturity of our globe, we have seen that there were seven grand periods or stages in its development, as there are seven stages in the development and compartments in the constitution of all perfect systems. These periods, however, are not throughout exactly coincident with the periods described by Moses, inasmuch as the two descriptions embrace subjects somewhat different. In our general geological survey we have

endeavored to unfold the history of the developments of the earth *as* such, speaking of the vegetable and animal creations only incidentally; while the object of Moses appears to have been to speak of the successive organization of those outer forms and conditions with which man is immediately, either sensibly or spiritually, connected. Hence, Moses passes over the first two stages of creation, or the chaotic-gaseous and the nucleated stages, mentioned in our generalization, with the simple and comprehensive remark, that "In the beginning God created the heaven and the earth," and commences his main description at an epoch when the earth was probably in a state of imperfect superficial consolidation, and when much of the water of the ocean was still diffused, as vapor, in the thick and turbid atmosphere. The earth is hence described as at that period "without form and void"—that is, without arrangement, and vacant—"and darkness was upon the face of the deep." This "darkness" may be conceived to have been a natural consequence of the state of the atmosphere, which was probably still so thick as not to be easily distinguishable from the fluid portions of the earth, and from the water which rested upon its surface, in which condition it would, of course, have been completely impervious to the solar rays. The first Divine operation naturally required, therefore, was to produce changes in, and precipitations from, the aqueous portions of the atmosphere, such as would admit of the descent of some degree of solar light to the earth's surface. This operation is described by Moses, in saying, "The Spirit of God moved upon the face of the waters: and God said, Let there be light: and there was light." This, according to the account, constituted the work of the *first day*. And here it may be remarked, once for all, that the phrase, "the evening and the morning," which is used as the standing synonym of the different

"days" in this account, seems to stand simply for the beginning and close of the different periods—a use of language similar to that employed by us when we speak of the "eve" or "morn" of a "new era."

It is said, that "God called the light Day, and the darkness He called Night." In this passage, the words "day" and "night" are probably (though not *necessarily*) used in their ordinary acceptation, and point to a revolution of the earth on its axis, and a successive illumination of its sides by the sun. But owing to the thick atmospheric vapors which still continued to prevail to a great extent, the sun would doubtless have still been invisible to a spectator, could such have been placed upon the earth's surface, and the amount of solar light that could have penetrated to the earth, was probably much less than is *now* received, even through the thickest and darkest clouds.

The next work seems to have consisted in producing further changes and regulations in the atmosphere, by which a more distinct line of demarcation was established between the waters intended to be suspended in the air, and those designed to preserve a more condensed form upon the earth's surface. Moses, being obliged to make the most of the few words which his primitive and meager language afforded, describes this work by saying, "And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters." Hebraists tell us that the word "firmament" is a very improper rendering of the original word, which signifies simply an *expanse* or *space*; "Consequently," (says Dr. Clarke) "that circumbient space or expansion, separating the clouds, which are in the higher regions of it, from the seas, etc., which are below it." During the high temperature of the earth's surface, which Geology proves to have prevailed in

those early times, there was probably every intermediate gradation between the most dense fluid and the most expanded vapor, the fluid and aeriform substances having no very marked line of distinction. While such was the case, the "circumambient space" supposed, could have had no *distinct* existence. A physical change which established the water, atmosphere, and aqueous vapor and clouds respectively *as such*, was of course the next necessary step in creation's progress; and this is all that appears to be alluded to in the passage before us as constituting the work of the second period or "day."

It was probably during the period comprised within this day, that the transition rocks beneath the coal measures were deposited. These contain the remains of animals and plants of low types, which are almost exclusively marine. But to the creation of these, Moses seems to make no allusion, which fact will not excite particular surprise, when we consider their comparative unimportance to the grand object which he had in view, which was simply to describe how the physical structure and conditions by which man is more *obviously* surrounded, came to exist.

The next work consisted in the partition of land and water (or the elevation of the former), and the development of terrestrial vegetation. "And God said, Let the waters under the heaven be gathered together, and let the dry land appear: and it was so. . . . And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself upon the earth: and it was so." This was the work of the third great period or day, and manifests a surprising agreement with the events of the period of the great Coal Formation. The universal prevalence of almost exclusively *marine*, and the almost total

absence of *terrestrial*, fossils in the previously deposited rocks, proves that the ocean, up to this time, covered nearly the whole surface of the earth—which is in exact agreement with the Mosaic record, which implies that the partition of land and water was not made until that period. But large areas of land being then slightly elevated above the level of the waters, these, as another strong corroboration of the record, were covered by a profuse vegetation, which subsequently became converted into the immense beds of mineral coal now found to be so essential to the physical comfort and social progress of the human race.

The next work is spoken of by the sacred cosmogonist in the following terms: "And God said, Let there be lights in the firmament of heaven, to divide the day from the night; and let them be for signs and for seasons, and for days and years. And let them be for lights in the firmament of the heaven to give light upon the earth: and it was so. And God made two great lights: the greater light to rule the day, and the lesser light to rule the night: he made the stars also."

To superficial readers, this passage has seemed exceedingly paradoxical. The supposition that the sun, moon, and stars, had no existence until the comparative atom which forms this earth, had attained to the advanced stage of its development, previously described, is, with any interpretation of the word "day," so unphilosophical and unreasonable as to utterly defy intelligent belief. Criticism, however, has shown that the translation of the passage before us, does injustice to the original, which does not necessarily mean that the heavenly bodies were not *created* until the fourth day. Professor Hitchcock, who is a learned theologian as well as geologist, says, upon this point: "If it be objected that, according to

Moses, the sun, moon, and stars were not created till the fourth day, it may be replied, that a more just interpretation of his language shows his meaning to be, not that the heavenly bodies were created on the fourth day, but that they were then first appointed to serve their present offices; and that they might have been in existence through countless ages."

Admitting such to be the true meaning of the passage, we find, again, that the record marvelously coincides with the indication of geological facts. In our previous survey of the natural history of the globe, we saw conclusive evidence that up to the close of the Coal Period, a nearly uniform temperature prevailed upon the surface of the earth in all latitudes, and that there could have been no distinction of warm and cold seasons. This is evident from the fact, that the rocks of that period, in all latitudes, contain the fossils of plants and animals analogous only to those which *now* flourish between the tropics. It is manifest that such a state of climate could not have been governed, in any great degree, by the rays of the sun, which vary so much as to their intensity, in the different latitudes; and hence, as remarked in our previous generalization, the sun's rays, during the Coal and previous periods, could not yet have penetrated the atmosphere, thick and heavy as it probably was, in such a way as would have rendered that luminary *visible* to a human spectator, had such an one been then placed upon the earth's surface. For the same reason the moon and stars must also, during those periods, have been invisible. Up to that period, therefore, the heavenly bodies could not have ruled the seasons, either as to their temperature or their distinct periodical revolutions; and all the light which could have descended from them to the earth must have been but dim and indistinct.

But in preceding pages it was shown, from the peculiar manner in which the impressions of frost-marks, the tracks of migratory birds, etc., occurred, during the geological formation immediately succeeding the Carboniferous Period (viz., the New Red Sandstone formation), that distinctions of seasons and climates must then clearly have existed, and hence that the sun must then have exerted his direct power upon the earth, which then, as now, varied in its intensity with the different positions assumed by the earth during its orbital revolution. An atmospheric condition which could thus have admitted of a direct descent of the solar rays, must also have rendered the moon and stars distinctly visible to such of the earth's tenants as had eyes to perceive them; and in these facts we have an abundant verification of the Mosaic record, as to the work of the *fourth day*. It consisted simply in those atmospheric clarifications by which the sun, moon, and stars were *appointed*, or allowed to exercise the office of, ruling the seasons, and dividing time into distinct periods.

The direct rays of the sun being thus admitted to the earth's surface, the latter consequently became habitable to higher orders of living creatures. Accordingly, the next stage of creation's progress is thus described: "And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And God created great whales, and every living creature that moveth, which the waters brought forth after their kind, and every winged fowl after his kind." Some of the "moving creatures" here spoken of as introduced into being, were probably wholly aquatic, and others were of the lower orders of air-breathing animals. It is remarkable that the remains of classes of animals here spoken of, first begin to appear in the New Red Sandstone strata, which is

the formation next above the carboniferous system, and which must have been succeeded, and measurably accompanied by the clarification of the atmosphere, spoken of as the work of the previous day. For it is in the Red Sandstone stratification that we find the footprints of frogs, tortoises, and *birds*. The latter were mainly, as Professor Hitchcock intimates, of the Grallæ family, or the family of *waders*, and were therefore, with the former, intimately connected with the water, as the Mosaic account implies. There can be but little doubt, therefore, that these birds were the very "fowl" of which Moses speaks.

The other part of the work of this period, according to the common translation, consisted in the creation of "*great whales*," etc. This, admitting our definition of the word "day," forms the only *apparent* discrepancy between geology and the sacred cosmogony; for whales do not appear to have existed before a somewhat advanced stage of the so-called Tertiary Formation, and a very long period after this time. But criticism resolves even this apparent discrepancy into a surprising harmony. Dr. Adam Clarke, who wrote before geology was much cultivated, and hence without the slightest idea of making out a harmony between its teachings and the declarations of Moses, remarks upon the expression in the passage before us: "Though this is generally understood by the different versions as signifying whales, yet the original must be understood, rather as a *general* than a *particular* term, comprising all great aquatic animals." Now the *marine saurians* were "great aquatic animals." These, with amphibious and terrestrial reptiles of enormous size, came in during the deposition of the New Red Sandstone, and extensively characterized the whole so-called Secondary Formation. Thus the Mosaic account of the work of the fifth

day, or grand period, is also admirably verified by geological facts.

Animals of the classes just described, both according to Geology and Moses, *preceded* the more perfect land animals, the mammalia, upon the stage of existence. The creation of these latter is said to have constituted the first part of the work of the following, being the sixth day, or period, which is thus spoken of: "And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so. And God made the beast of the earth, and the cattle after their kind," etc. The proof of the truth of this portion of the account is found in the remains of the mammalian quadrupeds of the Tertiary Period, in the more recent portions of which we have shown that there was an actual shading off of the animated tribes into the existing species. Moreover, the work of this day, or period, both according to Geology and Moses, was completed by the introduction of *Man* into being, as the grand ultimatum of all the creative efforts. Thence, so far as that great series of unfoldings was concerned, ensued a period of *rest*, and the present is that sabattic period.

The candid reader who has attentively followed me through this investigation, will bear witness that I have made no effort to explain away, or to change the *true* aspect of properly understood *facts*, in order to make out a correspondence between the teaching of science and those of Moses, but that I have labored to simply set forth the facts of the two revelations in their true aspect, leaving them to confirm or refute each other as they might. The coincidence between the two revelations, therefore, which, from generals to particulars, has here appeared so striking, is one for which no human collator is responsible, as it exists independently and unalterably in

the absolute facts of the case. All that is required to exhibit one revelation as a substantial transcript of the other, is an admission that the word "day" is used by Moses in the sense of an indefinite period—a sense in which it is used in scores of instances in the Bible, and a sense in which Moses *unquestionably* used it in Gen. ii. 4, where, in a more summary allusion to these same works of creation, he speaks of "THE DAY that the Lord God made the earth and the heavens."

As it is next to an impossibility to suppose that all these surprising coincidences could have been a mere work of chance, the conclusion is scarcely avoidable, that the account in the first chapter of Genesis, by whomsoever written, must have originated in a source of intelligence in which a general knowledge of the whole history of the creation was familiarly embraced.

It is quite certain, however, that Moses knew nothing, at least in an exterior way, about Geology; for of this science the whole human race has been ignorant until within the last century. I apprehend that nothing short of an hypothesis of a spiritual or Divine enlightenment, will be found adequate to explain the origin of this biblical and wonderfully accurate account of creation. Concerning the *laws* of such enlightenment, some explanations may be submitted in a future work.

I have deemed it useful to show, in this summary manner, the true bearings of geological science upon the initial revelation of the Bible, partly to correct a tendency which, strange to say, has been manifested in the modern *spiritual* mode of philosophizing, to treat lightly this and other revelations of the Bible, on account of the supposed "*unprogressed*" state of their writers; partly for the purpose of further illustrating the fact, that all true theology and other species of doctrine, whether found in the Bible or elsewhere, must conform to the

unavoidable deductions of scientific facts; and partly for the purpose of further unfolding that remarkable law of the three-fold and seven-fold correspondential series, which runs through all complete systems of truth, and of which the Mosaic generalization, properly understood, affords a conspicuous example.

That the seven-fold series of creative operations here spoken of by the sacred writer, exactly conforms to the natural and Divine law of sereal arrangement which we have heretofore unfolded, is obvious from the correspondences between the respective members of its Primary and Secondary Trinities, which will be perceived by an inspection of the following juxtaposed columns, and from the characteristics of the relations which each member of the series, from first to last, exhibits toward the others, which will be found to be the same which the same members in other serieses respectively bear toward their associates.

PRIMARY TRINITY.

1st Day. Diffused and rudimental *Light*: ("God said, Let there be light.")

2nd Day. Atmospheric and terrestrial distinctions, or more definite line of demarcation between condensed and vapory water. ("Firmament.")

3rd Day. Appearance of dry land; terrestrial vegetation.

7th Day. Rest, and Divine habitation in the Ultimate of the creative labor.

SECONDARY TRINITY.

4th Day. Definite solar *Light* (by the sun becoming *visible*.)

5th Day. Higher and first important forms of oceanic, terrestrial, and atmospheric life. ("Great whales" or aquatic monsters — saurians — and "fowls.")

6th Day. *Ultimate Tenants* of dry land. (Mammalian quadrupeds and Man.)

Here the correspondence between the works of the *first* and *fourth* days, or periods, is perceptible at a glance, in that they consisted of *different degrees* of illumination of the earth's

surface. The correspondence between the works of the *second* and *fifth* days is obvious, but becomes still more marked by the addition of a few facts which Moses, in his brief survey, left out, but which are supplied by geological science. The *second* day, according to Moses, was characterized by the development of more marked distinctions between earth, water, and atmosphere, expressed by the creation of the "firmament," or the super-terrestrial expanse; while geology shows that the *fifth* day was characterized by the development of a *second degree* of similar distinctions, whereby alternations of climates and seasons, cold and heat, rains, winds, etc., supervened. Moreover, the *fifth* day, according to the biblical account, was characterized by the development of *rudimental land* and *aerial* animals; while, according to geology, the *second* day, after the incipient creation of light, was further occupied by the creation of the *rudimental marine* animals, or the radiata, articulata, mollusca, and fishes of the so-called Transition Formation. The creation of these, Moses passes over in silence, the reason of which may be conceived to consist in their comparative non-importance, and in the fact that in that unintellectual age, they were not, as facts in nature, sufficiently conspicuous to excite general inquiry as to their origin.

Further correspondences are also developed, by the aid of geological science, between the *third* and *sixth* days, but concerning these I need not particularize.

If the reader will now take the trouble to compare the members of this series of creations as described by Moses, with the members of any seven-fold series of creations or operations which we have heretofore described, or which we may describe hereafter, he will find that *each member is to its series what the same member of any other natural seven-fold series is to the*

other members with which it is associated, and that between this and all other serieses there is the same correspondence as there is between any two octaves in music. It is, be it remembered, upon the fact of this correspondence between the serieses, whether generally or minutely inspected, that we base our conclusion as to the unity of plan which runs through nature, pointing to an origin in the seven-fold and corresponding harmonies of the one Infinite God, who, from His own Essence, has projected, from His own Life animates, and, from His own Wisdom, directs, all things. It is in perfect harmony with this supposition of a Divine originative and controlling Power, that Moses, in the simple and untechnical language of his times, refers the work of each of the successive periods of creation to a *Divine agency*, and not to any force of development inhering in nature as *independent* of God.

I may add, that if there actually is a perfect conformity, from generals to particulars, between the principles involved in this seven-fold series of operations mentioned by Moses, and those involved in every other seven-fold natural or spiritual series, whether it be found in science or in the Bible, this fact must be considered as strongly confirming, not to say absolutely demonstrating, our conclusion that there is a *mighty law* here involved, and must go far to convince reasonable skeptics of the truth of, at least, those portions of the Biblical revelation which are found to clearly recognize that law. Yet, from a close inspection of the sacred writings, it will be found that this law is not only expressly recognized in numerous instances, but that it runs through the whole Divine plans of operation, in reference to the human race, of which the Bible gives an historical and prophetic reflex.

CHAPTER XIV.

THE MINERAL KINGDOM; OR, KINGDOM OF CHEMICAL FORMS.

From the terrestrial creation, as a whole, we proceed to a brief consideration of the general sub-creations which it involves. The first of these is the MINERAL KINGDOM.

The Mineral Kingdom, in its most enlarged sense, embraces all physical or terrestrial substances, with their various forms and compounds. Being thus general in its range, it is hence a comparatively *indefinite* Kingdom; and it is for this reason, I suppose, that I have experienced more embarrassment in reducing it to distinct classifications, than I have in respect to any other system of being or operation; and, after all, I can only pretend to a comparatively close approximation to correctness in my conclusions. Such an approximation, embracing the *most comprehensive* serial arrangement of physical substances, is that exhibited in the following table:

PRIMARY TRINITY.	SECONDARY TRINITY.
1. Primeval gaseous or mundane chaos.	4. Secondary gaseous or terrestrial atmosphere.
2. Igneous liquid.	5. Segregated, embracing rudimentary crystalline forms, both solid and atmospheric.
3. Solidified amorphous.	6. Complete material arrangements and ultimate crystalline forms.
7. Governing imponderables.	

If the reader will carefully inspect this table, he will here find the same harmony of parts, the same correspondence between Primary and Secondary Trinities, the same order of relations, and the same principles of serial association, which he will find in all other natural seven-fold serieses heretofore exhibited, or hereafter to be exhibited.

But a still more specific classification of mineral or physical substances embraces all the simple elements, with their natural compound forms, as known to chemistry—as will be seen by the following table :

PRIMARY TRINITY.	SECONDARY TRINITY.
1. Alkalizable and oxidizable <i>simples</i> (such as Potassium, sodium, iron, lead, hydrogen, etc.)	4. Lowest <i>combined</i> forms (such as alkalis, acids, oxides, sulphurets, carburets, etc.)
2. Acidizable <i>simples</i> (such as sulphur, phosphorus, carbon, etc.)	5. Binary compounds (such as sulphates, carbonates, etc.)
3. Flagrators, or alkalizers, acidifiers, and oxidizers (oxygen and chlorine).	6. Higher and ultimate compounds.
7. Pervading and enveloping electroid, or etheroid unit, as a homogeneous involution and evolution of all forms.	

But the Mineral Kingdom, as commonly contemplated, is circumscribed to the realm of crystallized forms, and the amorphous substances from which these immediately proceed. A theory of a septenary arrangement of the Mineral Kingdom, as viewed in this aspect, might be here submitted, but, from not having made crystallography a particular branch of study, I have not sufficient confidence in its conformity to nature, and will therefore omit it. Enough, however, has been said to show that the Mineral Kingdom, in its more general aspect, conforms to the seven-fold serial and corre-

spondential law seen to apply in other cases and nothing is here discovered to mar, but every thing illustrates, the harmony and unity of the great plan of creation. With these remarks, then, we will proceed to consider the Kingdom of forms immediately succeeding the mineral, in the order of development.

CHAPTER XV.

THE VEGETABLE KINGDOM.

THE seven-fold constitution of the Vegetable Kingdom as a whole, is illustrated by the seven progressive developments in the growth of a single perfect tree, which consist of 1. The root, or little appendages thrown out from the germ before the stem appears; 2. The simple stem; 3. The branches; 4. The leaves; 5. The flower-buds; 6. The blossoms; and 7. The fruit. The seven corresponding divisions of vegetable forms may be traced as follows:

The *first* and lowest of these consists simply of confused radical fibers, which do not necessarily appear above the surface of the earth. In constitution, this degree of vegetation is but little superior to the finest forms of crystallization, from which it differs principally in respect to its soft and succulent nature, the frequent curvilinear directions of its fibers, and the circular forms of their transverse sections. Of this lowest kind of vegetation, we have examples in the slimy accretions which occur upon the surfaces of rocks, logs, etc., submerged in water; and of which the fibrous underground mould which occurs in warm wet soil, impregnated with rapidly decomposing matter, constitutes the terrestrial representative.

The *second* division of vegetable forms is represented by plants that have a simple stem or shoot projecting above the earth, but no branches nor leaves. Of these, some of the simplest species of sea-weeds afford examples.

The *third* division consists of the *branching* forms of sea plants, of which the *fucoides* afford an example.

The *fourth* division consists of terrestrial herbacea, which are characterized by fully developed leaves. But the lower forms of this general division also embrace lichens, mosses, fungi, etc.

The *fifth* division consists of arborescent cryptogamia, or of those perennial plants in which the organs of fructification are concealed.

The *sixth* division consists of the arborescent monocotyledonous, or of those flowering trees whose seed has but one lobe; and

The *seventh* division consists of the arborescent dicotyledonous, or of those flowering trees whose seeds have two lobes, and which are the most perfect forms of the vegetable kingdom.

This comprehensive classification, though new, is in accordance with the general order of succession in vegetable creations as indicated in fossilology, and is therefore natural. Each one of these divisions, of course, is subject to sub-classifications, which sometimes run parallel with each other; but an *herbaceous* and *arborescent* plant which possess the same number of stamens, pistils, or cotyledons, evidently should not simply on that account, be placed in absolutely the *same* class or order.

That it may the more clearly be perceived that this classification conforms to the serial and correspondential law heretofore unfolded, we will reduce it to the following form:

PRIMARY TRINITY.
(*Marine forms.*)

1. Radical fiber.
2. Simple stem.
3. Branching.

SECONDARY TRINITY
(*Terrestrial forms.*)

4. Terrestrial herbacea (*leafing.*)
5. Arborescent cryptogamia.
6. Flowering monocotyledonous.

7. Flowering dicotyledonous.

Here it is seen that the first member of the Primary Trinity, the radical fiber or the root principle, so to speak, of vegetation, has its counterpart and sub-correspondent in the first member of the Secondary Trinity, in the leafing plants—leaves being merely *aerial roots*. The second member of the Primary Trinity, consisting of plants with a simple stem, has its counterpart and sub-correspondent in the second member of the Secondary Trinity—the organs of fructification in the cryptogamous plants being connected with the leaves, and being mere shoots from them as from a root. Considering the cryptogamous plants in the Vegetable Kingdom as a whole, as corresponding to the flower-buds of a single tree, the third member of the Secondary Trinity, showing the *branchings* from the flower-buds, as from a stem, bears a certain correspondence to the third member of the Primary Trinity, embracing merely the *branching* forms of vegetation. The *seventh* member is not only of a more perfect organic structure, but it embraces all the more perfect *fruit-bearing* trees which afford nourishment to higher kingdoms, and therefore it may be considered as the crown of the whole Vegetable Kingdom. It is thus seen that the grand and natural divisions of the Vegetable World, conform to the septenary and ternary serial law; and its complete series will be found, on comparison, to correspond generally and particularly with all other complete series.

CHAPTER XVI.

THE ANIMAL KINGDOM.

THE Animal Kingdom follows as next in the order of progression, after the Vegetable Kingdom. Its divisions, in their regular order of ascension from lowest to highest, and also, generally speaking, in respect to their successive periods of development as shown by fossilology, are as follows:

PRIMARY TRINITY. (<i>Marine forms.</i>)	SECONDARY TRINITY. (<i>Terrestrial forms.</i>)
1. RADIATA (coral insects, crinoidians, star-fishes, medusæ, etc.)	4. REPTILES. (The lower forms of this division embrace also the terrestrial mollusca and articu- lata, such as snails, worms, in- sects, etc.)
2. ARTICULATA (sea-worms, trilobites, crabs, lobsters, etc.)	5. BIRDS.
3. VERTEBRATED FISHES.	6. MAMMALIA.
7. MAN as a terrestrial being.	

IN this table are represented three general divisions of marine forms, and three general divisions of terrestrial forms. The first division of marine forms is to its sphere of existence and to the divisions of marine forms which follow it, what the first division of terrestrial forms is to its sphere of existence, and to the divisions which follow it; and so also the one trine in its sphere corresponds to the other trine in its sphere, both in the complex and in the successive divisions of each.

It may be objected to the foregoing classification, that it

leaves out one important division of the animal kingdom, viz., the *Mollusca*. To this it may be replied, that the *Mollusca*, especially in its lower forms, seem, to be but a higher branch of the *Radiata*. Some of the lower or univalve shell-fish grow in clusters, or united compartments, almost as one animal, and in this essential characteristic are somewhat allied to the polipiaria, which comprises one class of the *Radiata*. This quality of growing in clusters, or connected compartments, is preserved even by some of the bivalves, such as muscles, oysters, etc. The detached bivalves, having locomotive powers, seem to be an ascension from these; and the still higher orders of mollusca, viz., the gastropoda and cephalopoda, seem to be but higher representations of the same system of creative design, which, as its lowest expression, evolved the polipiaria and crinoids.

I have personally observed that the whilk, which is among the higher orders of shell-fish, propagates through the medium of a zoophitic, or vegetable-like, form, with an attached stem, and containing leaf-like appendages or pods, in which the young are brought to foetal maturity. The *Radiata* and *Mollusca*, therefore, may be considered as comprehended in one general division of the Animal Kingdom, which division, however, should perhaps be designated by some term of more comprehensive significance.

It is thus seen, that the Animal Kingdom conforms to the same serial and correspondential law which we have seen running through all systems of creation previously contemplated, and which we will hereafter perceive runs equally through still higher developments. And with this, as the highest system of material creation, our more *specific* classifications of the grand departments of the universe without us, is completed.

CHAPTER XVII.

THE WHOLE AND ITS PARTS.

WE have thus ascended, through progressive stages of observation and induction, from the basis to the apex of the grand pyramid of outer creation. From the commanding position to which we have attained, therefore, it is proper to take a general survey of the ground over which we have passed, and to observe any general or particular facts which may thence present themselves, as bearing, favorably or otherwise, upon the conclusions to which we have been led, or as reflecting light upon still ulterior truths.

And first, a remark in reference to the method and order of our previous investigations: It will be remembered that we commenced with the observation of sensible facts, which lie upon the *exteriors* of Nature, and proceeded to trace them analytically to their elements and originative conditions, and those to *theirs*, until we arrived at the primeval and common chaotic Germ from which all things, by different ramifications, sprang. The nature and propriety of the *reverse* process which we thence pursued, with the naturalness of the *order* of successive results to which it led us, may be illustrated as follows:

The astronomer discerns in the distant heavens a faint whitish spot, which he calls a nebula. To the naked eye, it appears dim, indistinct, and undefined. He applies a telescope of moderate power, and the outlines of the same object are a

little more defined. With a still larger telescope, it appears still more definite; and so he goes on increasing his optical power, until the same object is resolved into myriads of minute stars, which appear like particles of diamond dust sprinkled upon the blue concave. By another increase of power, these stars are made to exhibit appearances of internal systematic arrangement. This is as far as the most powerful telescopes will go; but suppose that he had the ability to augment his optical power indefinitely; each of those stars, which at first appeared only as a shining point, may soon be made to glow as a resplendent sun, revealing a multitude of planets swimming in the sea of light by which it is surrounded. He now singles out one of those planetary globes as the special object of inspection; and as, by our imagined possibilities, the visual power is enhanced through other successive degrees, the forests, the fields, the streams, the trees, the flowers, and even the insects, which may exist upon the surface of that planet, or the animalcules which sport in its stagnant waters, would successively come into view. Now, be it remarked, that all these successive particularizations, even down to ultimate minutiae, are involved in that faint luminous spot, which, as a most comprehensive *general*, is first seen by the naked eye in the remote heavens.

Our process of synthetical investigation has been similar to that just supposed, we having the advantage of the actual presence and personal inspection of the minutiae included in the general subject of our thoughts. With a *mental* telescope we have penetrated, not into the distance of *space*, but into the *corresponding* distance of *time*, and beheld the universe in the aspect of one common nebulous mass. By following the natural history of this one general mass through its successive approximations to our own period, we have seen it

successively unfolding solar systems, geological developments, mineral kingdoms, animal kingdoms, and human races, with all things which they respectively include. It is to be observed that each of these successive particularizations is based upon, and was included in, the next preceding general, as all are based upon, and included in, the *all-comprehensive* General.

Moreover, that the *order* in which these particularizations, Kingdoms, or sub-creations have been brought under review, is not an order arbitrarily adopted for our own convenience, but clearly one observed by nature herself, is evident from the fact, that no two systems or Kingdoms, as arranged in our series of inquiries, can be transposed. This illustration of the relations of *generals* and *particulars* also clearly shows, that all truths are but involutions and evolutions of one fundamental truth—hence that all truths must bear certain relations and correspondences to each other, from their origins throughout their successive ramifications, even to their ultimates; and that no truth can be *fully* understood, except in the general and particular light of all others.

Moreover, if the serial order in which the grand divisions of nature, as a whole, have been brought under review, is according to the order of progressive development observed by nature herself, the same is generally true of the serial order of the seven sub-divisions which have been applied to each of these *grand* divisions. By a particular review of either of these classified sub-divisions, the reader will find, for example, that the first member of the series is naturally germinal, and that the seventh is naturally ultimate, to all the others; and that no two members of the series can be transposed without deranging the harmony of the whole series. And though we, of course, claim no absolute exemption from particular errors and imperfections in the classifications which have been sub-

mitted, it is nevertheless claimed that their manifest *general* conformity to nature, together with their ternary relations and correspondences, involved, after identically the same general method, in each seven-fold series, clearly reveals the presence of a grand structural or associative LAW which, in a corresponding manner, and in different degrees of development, governs the numbers, relations, and succession of parts, in every complete system of natural unfolding. Of this law, as before repeatedly intimated, the diatonic scale in music, with its seven notes, is the natural and oral exponent.

Having thus subjected the grand divisions of nature to review, and discovered the application of this principle of serial and correspondential classification to them all, let us now see whether the connected and successive creations thus brought under review, will naturally fall into the form of *one grand System*, in which our principles of serial arrangement will be exemplified. This may be best exhibited by the following table :

PRIMARY TRINITY.	SECONDARY TRINITY.
<i>(Structural.)</i>	<i>(Organic.)</i>
1. Firmamental and sidereal universe.	4. System of chemical or comprehensive mineralogical arrangements.
2. Solar systems.	5. Vegetable kingdoms
3. Geological developments.	6. Animal kingdoms.
ULTIMATE.	
<i>(Intellectual.)</i>	
7. HUMAN RACES, as to their merely <i>terrestrial</i> constitutions, affections, and thoughts.	

Not only do we observe in this series a natural order of succession of parts, which will not admit of addition, retrenchment, or transposition, but we also observe the same ternary

relations and correspondences which we have seen are involved in all the series previously examined. Thus the first member of the series, which is rudimental-*structural*, corresponds to the *fourth* member, which is rudimental-*organic*;* the second member is the transition-*structural*, and corresponds to the fifth (the Vegetable Kingdom), which is the transitional-*organic*; the third member is the (physically) perfect-*structural*, and corresponds to the sixth, which is the perfect *organic*. And the seventh is ultimate, exhibiting the perfection and united sublimation of all—in this respect corresponding to the seventh member of every other series, even as the first member in each series corresponds to the first member in all others; the second to the second, etc. The same principles of serial, septinary, and correspondential classification, thus apply equally to the generals and the particulars of nature, at least so far as such particulars have been brought under review.

But while the respective members of each seven-fold series, whether on a high or low scale, including the great series of all serieses, correspond to the same members, as numerically designated in all other serieses, these correspondences are of different degrees of directness and intimacy, according to numerical relations more complicated than those which have yet been brought into view. This, together with the manner in which general and particular serial correspondences are involved in one complete system, may be illustrated partially, but sufficiently for our present purpose, by a reference to the seven prismatic colors and their involved properties. It is found that, by causing each of the seven colors of decomposed

* A crystal possesses a kind of molecular life, and has different parts, angles, and poles, which perform different functions, as shown by Reichenbach; it may therefore be considered as an *organism*, though of the lowest kind.

light to pass separately through a second prism, they may be still further decomposed, and form a secondary iris, in which each of the seven colors will again be visible. Now the first or *general* iris represents the great System of systems, considered as *one*, while each included iris represents one of the sub-systems involved in the latter, and which is also seven-fold. In other words, the grand seven-fold System of nature is composed of all its included and subordinate seven-fold systems, in the same way as the grand iris is composed of all the elements involved in its included irises, there being in either case a similar interdependence of parts; and hence there is the same unity in the System as a *whole*, that there is in each one of its analogous and component sub-systems. The grand System of nature, and each one of its sub-systems, then, correspond to each other in the same way as the grand iris, and each of its included sub-irises correspond to each other, according to their similar numerical designations. But while this is the case with the iris and its included sub-irises, it is evident that one of these latter, based, for example, upon the general *red* ray, would bear a *different degree* of correspondence to other seven-fold divisions of color, from one that is based generally upon the *yellow*, *blue*, or any other ray; and the same is true of the great System of nature and its sub-systems.

It was before shown that each seven-fold system of nature is accompanied, in its development and functional operations, by seven corresponding dynamic agents, and also seven corresponding laws. It may therefore be said that these dynamic agents and laws are also, either identically or by their natural representatives in different degrees of ascension, subject to the same *comprehensive* and *involved* classifications which we have just seen to apply to their corresponding

outer developments, as presented in the universal Fabric of Being and its parts. It would, indeed, be difficult to get a set of terms sufficiently comprehensive, and yet sufficiently definite, to apply equally to all systems and sub-systems involved in a universal classification; but if the reader will consider the terms we may employ as being themselves *correspondential*, and as expressive merely of *general principles*, he may find the general and particular systems of nature, in their three-fold relations of Dynamic Agents, Laws, and Developments, represented, with approximate truthfulness, in the following table:

DYNAMIC AGENTS.	LAWS.	DEVELOPMENTS.
1. Heat.	Expansion.	Chaos.
2. Light.	Attraction.	Nuclei.
3. Electricity.	Circulation.	Forms.
4. Organic, or odic heat.	Aggregation.	Incipient organism
5. Odic light.	Segregation.	Ascended organic forms.
6. Odic aura.	Sympathy.	Universal association.
7. Vitality.	Life.	Unity of totality.

Applying the *fundamental principles* of this classification, in different degrees, to the universal system, and to all its sub-systems, we have here a representation of the connection and harmonial relations of the Whole with the parts, and the parts with the Whole, of the Macrocosm or the universe without—corresponding to the connections and relations of the parts and the whole, of the Microcosm, or the universe within. Here, then, is erected, “without the noise of the hammer,” that universal Temple before spoken of, whose

timbers, hewn by God's own hand, consist of all those *facts* and *principles* which lie in the Realm of Being without us, and which mere *analytical* science necessarily views in everlasting isolation and confusion.

CHAPTER XVIII.

DUALISM OF PRODUCTIVE FORCES; OR, THE DIASTOLE AND SYSTOLE OF NATURE.

FOLLOWING link by link the descending chain of analogy, the conclusion was before arrived at, that in the beginning, the materials of the universe consisted of one diffuse, chaotic, or gaseous mass, without distinction of parts, or definite internal motions. Reasons were also submitted for believing that these material conditions were not eternal, but that they originated as emanations or projections of the more exterior essences of the Divine Personal Constitution. It was shown that, inasmuch as this whole mass of *physical* substance thus originated from Divine *spiritual* substance, so *physical Heat* in this substance originated from Divine *spiritual* Heat, which is Love, and that *physical Light* originated from Divine *spiritual* Light, which is Wisdom. It was also shown that Heat is accompanied with a force or law of Expansion; and that from Heat and Light combined, originated the force or law of Attraction or Contraction. As Divine Love and Wisdom (forming a Duality, or productive unity, consisting of positive or negative, or male and female Principles) constitute the spiritual Alpha and Omega of all generative forces, so it is apprehended that their physical counterparts, consisting of the forces of Expansion and Attraction, may be found to maintain an equally fundamental relation to all modifications of force, law, and operation, existing in the realm of created Being.

If we again glance at the systems and sub-systems of operation which nature presents, we will find abundant exemplifications of this fact. Thus, as the forces of Expansion and Contraction proceeded in their operations in the primeval chaotic mass, the particles which were by nature fitted to remain in an *aeriform* or *ethereal* state, and those which were naturally fitted for aggregation into *dense* forms, were separated. The latter class of particles, by a general assemblage, first formed the universal nucleus, and then, successively the nebulous rings, segregated masses, and stellar and planetary systems. The telescope now reveals these masses of condensible materials apparently in all stages of progress in the heavens, from the indefinitely formed and irresolvable nebula to the globular cluster of stars. This latter is the form peculiar to the highest possible degree of cosmical perfection, and, at the same time, the highest natural degree of cosmical *condensation*; and it may hence be supposed to be accompanied with the highest naturally attainable degree of levity and purity in the circumambient ether. But these states are ultimate achievements of the joint and constant action of the fundamental laws of EXPANSION and CONTRACTION.

We will find, on due consideration, that these same principles apply also to each creation *included* in the cosmical, whether it be organic or inorganic. Thus, in the Mineral World, the metallic ore that is now segregated into distinct veins, evidently must have originally existed in *diffusion* in the surrounding rock. The particles which *originally* occupied the present position of the mineral veins, must have been dispersed by a force of expansion (virtually or actually) which was precisely equivalent to the force of mutual attraction which brought the metalline particles together in their place. The same tendency of kindred and originally diffused mineral par-

ticles to draw together into the form of dense masses, is, perhaps, still more forcibly illustrated by the flint nodules found in beds of chalk, and which are generally of a more or less rounded form, evidently indicating an original state of *solution* in the surrounding mass, from which they have become *condensed*, as they are now found.

The first forms assumed by the *vegetable* materials that exist in the world, were also diffuse and chaotic. Such were the marine accretions of germinal slime, with their radical fibers, and subsequent efflorescent, simple, and microscopic stems. Several gradations of plants as they rise above these, are still of imperfect exterior forms, of a loose and succulent nature, and of an internal structure entirely cellular—indicating, as yet, but small progress in the condensive principle. In these, however, the whole Vegetable Kingdom as *one* creation, has its incipient and rudimental development. Further segregations and condensations of the vegetative elements are decidedly manifested in the subsequently formed *terrestrial* plants possessing a *vascular* tissue and ligneous fiber. But as creation proceeds, still higher forms, possessing more marked and widely diversified characteristics, are gradually developed, until the flowering and dicotyledonous plants of the present era came into being; and these show the closest possible connection of congenial, and the most perfect elimination of heterogeneal vegetable elements. Hence, they exhibit the ultimate degree of the *Condensive* and *Expansive* principle which can be naturally applied to the Vegetable Kingdom.

In the Animal Kingdom, including the human, the same principles are distinctly operative; and this, too, both with reference to the individual organism, and the whole collection of living beings. Professor Agassiz, who has investigated the subject of embryology perhaps more thoroughly than any

other man, tells us, that after the fecundation of the ovum of any animal, and its division into cells and layers, the organ of circulation proceeds to its incipient development from the *middle* layer of the germ. "First," the blood appears by a simple process of liquefaction of the cells. It can be seen under the microscope how the particles, or the cells of that layer, begin to loose at the outer margin, and to move between themselves, and to run in particular directions, and to combine into currents, and those currents to assume particular directions, *before there is a heart, and before there are blood-vessels*. It can be seen in every chicken under so low a magnifying power, that no one should lose the opportunity of seeing this wonderful sight. When blood corpuscles *move from the center toward the margin of the germ* [Expansion], the other cells, which become loose in the periphery of the germ, begin to *move toward the center* [Contraction]. In the beginning, there being no current circulating, the two collections of fluid meet, and finally become regular currents, by means of channels through which the blood runs for a regular *circulation*.*

These fundamental, expansive, contractive, and circulatory motions are subsidiary to the development of a *fourth* operation, by which affinitized particles floating in the circulating menstruum are brought into conjunction, and deposited in the form of solid tissues. They are at first aggregated on all sides of the circulating channels, and form the blood-vessels, the ramifications of which (says Agassiz) are at first constantly

* Agassiz's Lectures on Comparative Embryology. Here we have, in the words of one who wrote without any view to the distinctive philosophy of the present treatise, an illustration of the successive origins of the laws of Expansion, Contraction, and Circulation. Considering these facts and principles as equally applicable, on a large scale, to the great fecundated germ or *ovum* of the cosmical creation, it will illustrate perfectly the incipient process by a prolongation of which the universe received its present mature form.

changing. But one portion of the central vessel soon becomes enlarged, and assumes the form of a simple elongated sack. This, centralizing and expressing in itself the *previously diffused expansive* and *contractile* forces, performs a constant succession of diastolic and systolic motions, and constitutes the rudiment of the future heart.

Other processions from the blood-vessels form, in like manner, the rudiments of the alimentary canal, the liver, the lungs, the brain, etc. These, by a constant rejection (through the expansive or emanative force) of particles foreign to their respective and appropriate composition, and as constant an attraction and appropriation of the particles which they need, finally arrive at the full maturity of their complex structures, and together, form the complete living organism. The complete organism, therefore, manifests the perfection of elimination of unsuitable substances from each particular organ (which substances, therefore, go to form other organs to which they *are* suitable), and the perfection of condensation or aggregation in each organ of those substances which are suitable to its own composition.

The same remarks are, in *principle*, applicable to the whole animated creation as to *one grand Form*. Its first and lowest development, as shown by fossilology, consisted of polypiaria and other radiated forms. Now, the polypi of a coral reef may almost be considered as one extended animal, with little distinction of parts. The substances and functions of heart, stomach, lungs, brain, etc., seem to be interdiffused and confounded with each other in such a way that one portion of the structure is no more vital than another, and therefore, into however numerous or small fragments this animal substance may become divided or subdivided, each fragment, still chaotically embodying in itself *all* the principles of vitality and

organization, continues to live and grow as a distinct animal. It, therefore, corresponds to the primitive cellular structure of the impregnated ova of the higher animals. In the higher forms of the Radiata, the organs, with their functional operations, are perceptibly more distinct from each other. In the Articulata, there is still more definite association of the elements of organs into their distinct and appropriate forms; but this association is still so imperfect, that if the lobster or crab, for example, loses a claw, it eliminates from other portions of its system elements which form another claw—thus showing that the claw-principle, so to speak, previously existed undeveloped, in the other parts of the organism, by a draft upon which the recuperation is now produced. And so in each succeeding class in the ascending scale of animal creations, heart becomes more distinctly heart, brain becomes more distinctly brain, and all the other organs become correspondingly more distinct and highly developed, and more free from those particles which properly belong to other organs, until the perfection of living organization is attained in the perfected *human* form, which may be considered as the whole Animal Kingdom in the aggregate, with something more besides.

And so, reducing these specific subjects of contemplation to one comprehensive view, it may be said, that in the beginning the *material* elements of man, animal, vegetable, mineral, planet, sun, and firmament, existed in common interdiffusion in the great, universal, and undistinguishable mass of nebulous matter, in such a way that each part was lost in all other parts. The great mass, then, formed, as it were, one grand Polypus, or one grand ovum, corresponding to the ovum of an animal, and from it, after fecundation, and by means of a constant incubative and superior influence, the ultimate develop-

ment of the complex system in its mature form, was to arise. Materials in the primitive and lowest degree of refinement, draw together according to rudimental affinities, at the same time evolving their uncondensable elements, and thus form vast and indefinite nebulous aggregation, with their circum-ambient ether. Further evolutions and condensations, and consequent refinements, form, successively, firmaments, suns, planets, mineral aggregations, plants, animals, and finally the bodies of human beings—all of which, from first to last, have directly or indirectly collected and selected their materials from the great mass of *all* materials, even as the nodules of flint, before spoken of as embodied in the strata of chalk, have collected their component silicious particles from the mass of surrounding materials in which they must have been originally diffused!

The fact that, in the process of all formations, there is an expansion and evolution of uncondensable elements from the centers of their chaotic materials, as well as a clustering around central nuclei, of those particles capable of constituting the tangible structure with its various parts, more fully illustrates the doctrine heretofore advanced, that all forms and organisms, from stellar assemblages, individual suns, and planets, to crystals, vegetables, animals, and human beings, are surrounded by an *aromal counterpart* or "sphere." It will be borne in mind, that it is by the inter-action of these aromal counter parts, or spheres of different forms and organisms (and which are always expressive of the specific interior qualities of the latter), that these forms and organisms are brought into what may be called "*magnetic sympathy*" with each other; and it is by the combined aromal spheres of all organisms, forms, and systems, that the great inter-active nerve-aura of the universe. as *one* Body, is made up.

The expansions and emanations *from* centers perpetually prevalent throughout the whole domain of forms and organisms, may be considered as one general *diastole*; while the contractions and precipitations *upon* centers, likewise universally prevalent, may be considered as one general *systole*; and these motions, in their more progressed and periodically *alternating* forms, are expressed in the secular expansions and contractions of planetary orbits; in the oscillations of heavenly bodies between their aphelion and perihelion points; in the ebbing and flowing of tides; in the inspirations and expirations of plants; in the dilations and contractions of the human heart; and in the breathings and pulsations of microscopic forms of life, which sport in a single drop of water.

In attributing thus much to the laws of Expansion and Contraction (or Attraction), it is not by any means intended to supersede the septenary divisions of laws, as presented in preceding pages. Our object has rather been to show that these two *fundamental* laws, being, as it were, male and female in conjugal unity, are the parents and grandparents of all other laws. Thus it is from a combination of Expansive and Contractive movements that the law of *Circulation* immediately ensues in every portion of the creation, even as the same ensues in the animal and human systems, from the expansive and contractile motions of the heart: and as particles are thus made to flow throughout each system, and are placed in general intercommunication with other particles, there is occasion given to the operation of the *fourth* law, by which mutually affinitized particles, whether in organic or inorganic creations, unite together and form the tissues of the permanent physical structure. Thence, after performing their appropriate offices, and undergoing specific refinements, they are

taken up and re-deposited in higher and more complex masses or tissues, or excreted entirely from the system, according to the fifth law—the law of *segregation*—the same being also applicable, in different degrees, to each creation; then by mutual impartations of essences and forces between these masses or tissues, as necessary parts or organs of the system, a *sixth* law is developed—the law of universal sympathy and harmonial reciprocation. Finally, all these laws and operations, harmoniously combined, give occasion to the normal manifestation of the *seventh* and highest law—the law governing the functions of the complex unity, and in which the principles of Love and Wisdom, Heat and Light, Expansion and Attraction, with all their modifications and subordinates, are embraced in unitary form.

As these Expansive and Attractive operations are dependent upon physical Heat and Light, and these are ultimately dependent for their generation upon *spiritual* Heat and Light, which are conditions of Divine Love and Wisdom, so it follows that Divine Love and Wisdom pervade nature co-extensively with Expansive and Attractive forces, and are the fundamental and essential constituents of the life-principle which inheres in every form of being. Things live, therefore, only in proportion to the degree in which they are recipients of the essences and forms of Divine Love and Wisdom; and without these, all things would be dead.

CHAPTER XIX.

CIRCLES.

It was before shown that the constant Expansive and Contractive forces, particularly illustrated in the previous chapter, call into requisition the law of *Circulation*, which gives *form* to the motion of particles impelled by the previous forces. By circulation is meant a proceeding from a given point or condition, and finally returning to the same, whether the line of progression described by the movement is mathematically that of an exact circle or not; as is illustrated by the flowing of blood from the heart, through various channels back again to the heart.

But it is here to be particularly observed that the blood, in passing from the heart, through various parts of the system back again to the heart, deposits certain portions of its elements in various fleshy and osseous tissues along its path. This example, taken from the functional operations of the *Microcosm*, or little universe, serves as a sure index of similar operations which occur in the various departments of the *Macrocosm*, or great universe, and leads to the remark, that all regularly circulating materials, whether in the human, the animal, the vegetable, the mineral, the geognostic, or the astronomical department of creation, impart certain of their elements to the ambient spaces through which they pass. It is by the aggregation of such imparted elements that all regularly developed forms in nature have their being; and as

it was heretofore shown that all natural movements and developments observe a regular serial order of successive gradations, it follows, from the law of Circulation, that this serial order, as applicable to each system or degree of nature, must exemplify the *circle*. This idea of the universality of the circular constitution and movements of things, shall now be more particularly illustrated by facts.

Extending our observations to the heavenly bodies, we see *circular motion* everywhere prevailing. Satellites move around planets, planets around suns, suns around still greater suns, and an extension of the analogical chain renders it, as before shown, extremely probable, not to say certain, that all secondary bodies in universal space, revolve in common, around one grand primitive Center and Source of attraction. If this be the case, then, whatever particular movements the secondary bodies may have assumed from the development of *forms* of internal forces peculiar to themselves, these movements are subordinate to the great material Source of movement, and the forces by which they occur are only reproductions or ascensions, in specific and modified forms, of the forces which primarily appertain to it.

But as the forces producing these primitive rotatory and orbital motions in the universe, are the final source of all those diversified ramifications of circular movement, which are manifested by subordinate systems, suns, and planets, so the orbital and rotatory motions of planets are the more immediate parents and dependencies of still more diversified and minute systems of circular development. From the orbital motion of the earth, for instance (and the fact also applies to other planets), results a continually repeated *circle* of *thermal changes*, which mark the various seasons of the year. These give rise to the various annual series of vegetable and other

developments. In the genial heat of spring, the seed that has sunk into the moist vegetable mould, expands and puts forth successively the stem, the branches, the leaves, the flower-buds, the flowers, and the fruit containing seed of the same species of that from which the plant sprang. Then, as the frosts of winter begin again to prevail, the life of the plant becomes extinct; its ripened seeds are scattered upon the ground, to become the progenitors of other plants of the same kind, and the materials of the plant also sink to the earth to replenish the vegetable mould from which they sprang. Thus the same general condition is again brought about with that from which the first plant sprang; and the germination, growth, maturity, and decay of the plant, with the scattering of its seed upon the earth, exemplifies a complete *circle*. So with the putting forth of the foliage, the development of the blossoms and fruit, and the final hibernation of *arborescent* vegetation.

Coincident, also, with the changes of the seasons, are the periodical awakenings of certain animal instincts, and also the occurrence of certain conditions in the human, physical, and mental economy. These changes, occurring, as they do, in regular serial succession, and always returning to the point from which they started, exemplify, also, the Circle.

And so, from the alternations of day and night, which, with their successive hours and moments, mark a diurnal circle of physical changes, still more minute circles of change ensue, in the economy of organic beings. Such are the circles of wakefulness and sleep; of activity and repose; of organic waste and recuperation, with all their intermediate and transitional stages, whether we apply the remark to the vegetable, the animal, or the human creation. And it may even be said that every passage, from one degree or stage to

another, in the progress of any complete circle of unfoldings, involves a circle or system of a minuter kind, until we get down to the physiological functions of the organism of an ephemeron, to the circuit of blood and organic deposits in the system of an anamalcule, or to the orbital and axial revolutions of an atom.

It may also be said that the progression from the origin to the dissolution of any system, or to its passage into another form, involves the circle; and this is equally true of the universe as a whole, of its included stellar and solar systems and individual worlds, and of the further ramifications of creation, constituting the mineral, vegetable, animal, and human kingdoms, together with their various genera, species, and individual forms, respectively.

The minutest of these circles of movement and development, are included in, and are, in some sense, dependent upon, the greater, and those are in like manner included in and dependent upon, still greater (which, therefore, form circles of circles), and all are included in the *great* Circle which comprehends all movements and developments in the universe, from its periphery to its center, from the whole unimaginable vortex of being to a single atom of matter, and from the very origin to the very end of all material things.

The close of each comprehensive circle of operations marks an era, not only in its own history, but also in the history of its included circles, which are, to some extent, dependent upon its state for their own specific states. For illustration, the earth, during a single orbital revolution, makes, to sense, three hundred and sixty-five revolutions on its own axis, occasioning the same number of repetitions of the phenomena of day and night. But these days and nights, or circles of diur-

nal change, vary as to their length, temperature, etc., with the different stages of progress which are attained in the *annual* circle of revolution. But, if the reasonings of Maedler and others are to be relied upon, the whole Solar System, including the earth, is sweeping round a grand common center, which is so distant, that a single orbital revolution can not probably be accomplished in a less period than eighteen millions of years. As such a revolution will constitute the *great year* of the solar system, it is extremely probable that the progress of this revolution will be marked with changes in ethereal elements which affect climate and the various circles of organic creation upon our globe, in a manner analogous to the influence of the orbital revolution of the earth, upon the length and other characteristics of the days and nights, and thence, also, upon the annual developments in the vegetable and animal kingdoms. This gradual alteration of the position of the Solar System in the sidereal spaces, and the elemental changes consequent thereupon, may of itself be sufficient in the course of time to work an entire change in the character of organic life upon our globe; and still mightier changes in still mightier periods of time, may be wrought in the whole aspect of creation, physical and moral, by those inconceivably more stupendous revolutions to which all of these are subordinate.* It is by the combined influences of all other circles of movement and creation, that each particular circle is precisely *what it is*; and whenever there is any change in the functional operations of any portion of the grand system of Being, or of any of its sub-systems, physical, mental, or moral, there is, according to

* Professor Nichol has suggested the idea that the marked changes of climate, and hence of the organic and other productions of the earth, which occurred during the geological periods, may not have been entirely disconnected with the movements of the solar system through the stellar spaces. (See Nichol's "Architecture of the Heavens.")

the law of sympathy, necessarily some co-related change in all circles of operation included in this, however inappreciable to human conceptions that change may be.

Thus do we see that the great system of universal Nature, from its most comprehensive outlines as a whole, down to its infinitesimal parts, is one compact system of co-related "wheels within wheels," which play harmoniously together, as the various and mutually dependent parts of a most sublime and magnificent Machine! It is a machine, however, which, notwithstanding its perfection as a machine, is neither absolutely self-propelling, nor can it evolve its appropriate fabrics, and thus fulfill the designs of its Maker, without the constant and intelligent superintendence of a superior Power—even the Power from which *it* received *its* origin—as has before been intimated, and will be more particularly illustrated hereafter.

The general and particular *numbers* of progressive gradations which extend from beginnings to endings, and thus constitute each known circle of developments, or each known form of a perfect series, that is inwoven with all others in the texture of nature, have heretofore been maintained to be **THREE** and **SEVEN**. The reasons for considering these as the numbers of perfection applicable to every complete system of being, have been extensively illustrated in foregoing pages, and need not be repeated in this place.

CHAPTER XX.

THE DOCTRINE OF DEGREES.

THE exposition of the *serial* and *circular* order of nature's operations and constituent parts, as given in the foregoing chapter, prepares us for the more full comprehension of another doctrine, which is of no less importance than the previous one. I refer to the truth that each complete system of creation and operation, from greatest to smallest, together with the whole realm of being as *one* System, is resolvable into distinct *Degrees*, associated with each other according to a certain definite order—and that each complete System as one *comprehensive* Degree, is connected, after the same general order, with the one immediately beneath, and that immediately above it, in the general scale. This doctrine of Degrees has been constantly intimated in foregoing discussions; but its importance as a general guide to truth, demands for it a more direct and particular illustration, which shall now be given.

The writer's theory of Degrees was formed mainly from a direct study of nature, and with but little immediate aid from human suggestions beyond what was contained in the mere word "Degrees," as applied to nature's unfoldings; but when on the point of placing the present work, containing a chapter on this subject, in the hands of the printers, my attention was called by a friend to the teachings of EMANUEL SWEDENBORG on the same subject. So far as I understand what that celebrated philosopher has written upon this theme, I am delighted

in being able to recognize it not only as entirely true, but highly interesting and important; at the same time that I find in it a confirmation of the *principles* involved in my previous thoughts upon the same subject. This, however, is said without the intention to intimate any opinion as to the truthfulness or untruthfulness of the general writings of Swedenborg, concerning which, indeed, I know comparatively little.

The doctrine of Swedenborg concerning Degrees, is essentially similar to that which I had conceived, the main difference, aside from his peculiar terminology, consisting in his exclusive use of the *ternary* division, whereas I, as a general rule, use the *septenary*, as *involving* the ternary. In Swedenborg's writings, however, I find many features and applications of this doctrine of which I had not before conceived; while, in my own previously embodied thoughts upon this subject, there were ideas which I have *not yet* found in Swedenborg. I am, therefore, induced to so far modify the chapter I had written on this subject, as to give a general reflex of what is essential and fundamental in both forms of the conception, in doing which I shall so far change my own previously adopted terminology, as to avoid a confounding of ideas essentially different, as originating with the Swedish philosopher and myself.

Swedenborg makes Degrees of two kinds, viz., continuous Degrees, or Degrees of latitude, and discreet Degrees, or Degrees of altitude. Continuous Degrees, or Degrees of latitude, are described as being "like degrees from light to shade, from heat to cold, from hard to soft, from gross to subtle, etc." But Discreet Degrees are described as "entirely different" from these, in that "they are in the relation of prior, posterior, and postreme, or of end, cause, and effect. They are called Discreet Degrees," continues the writer, "because the prior is

by itself, the posterior by itself, and the postreme by itself; but still, taken together, they make a one."

Further illustrations of the same subject are given as follows: "It is well known by ocular experience, that each muscle in the human body consists of very minute fibers, and that these fasciculated, constitute those larger ones, called moving fibers, and that bundles of these produce the compound which is called a muscle. It is the same with the nerves: very small nervous fibers are put together into larger ones, which appear like filaments, and by a collection of such filaments the nerve is produced. It is also the same in the other compaginations, confasciculations, and collections of which the organs and viscera consist; for these are compounds of fibers and vessels, variously fashioned by similar degrees. The case is the same also with all and every thing of the Vegetable Kingdom, and with all and every thing of the Mineral Kingdom; in wood there is a compagination of filaments in three-fold order; in metals and stones there is a conglobation of parts also in three-fold order. These considerations show the nature of Discreet Degrees, namely, that one is formed from another, and by means of the second, a third, or composite; and that each Degree is discreet from another."

Inasmuch as the second Degree in any trine, proceeds from the first, and the third from the second, it was also taught by Swedenborg, that "the first Degree is all in all in the subsequent degrees;" and that "the ultimate Degree is the complex, continent, and basis, of the prior Degrees;" by which latter phrase I understand to be meant, that in the ultimate Degree, all the Degrees receive permanent, potential, and utilized embodiment.

This doctrine of Degrees is extended by Swedenborg to every department of existence, whether in the physical, moral,

civil, psychological or spiritual worlds, and even to the infinite Divine Constitution itself, of which they are the outbirths and correspondences. He, indeed, maintains that all and every thing in each form of being, from greatest to smallest, of which triunity may be predicated, contains Degrees both continuous and discreet. He maintains that the knowledge of Discreet Degrees is of the greatest philosophical importance, and that one who adequately possesses it, will thereby be enabled to see causes without the previous indications of their effects, and may even form accurate conclusions respecting things invisible, to which the same doctrine of degrees must necessarily apply.*

Such, then, is the doctrine of Degrees as taught by Swedenborg. But, though it is true, so far as it goes, I am not aware that it even claims to be perfect in such a sense as not to admit into its composition some additional considerations. I do not suppose that Swedenborg himself meant to convey the idea that each one of his Discreet Degrees was itself an absolutely *simple* unity; and it is highly probable that if he had been questioned directly on the subject, he would have admitted that each one of these was itself of a three-fold constitution, especially as he has apparently carried the doctrine of the trine down even to infinitesimals.

Let Swedenborg's first Discreet Degree, then, stand for what, in the septenary classifications given in the preceding pages, has been called the "Primary Trinity;" let his second Degree stand for our "Secondary Trinity;" and let his third, or ultimate Degree, which he says is the "complex, continent, and basis of the prior degrees," stand for our *seventh* division,

* See Swedenborg's "Divine Love and Divine Wisdom," from No. 179 to 241.

which we have constantly, though in other terms, represented as the complex, continent, and basis of all previous divisions—and this view without the slightest violence to any essential doctrine of Swedenborg, will bring the theory of Degrees precisely into the form in which I had conceived it. I believe that while Swedenborg himself maintained that triunity was predicable of all completeness, he also distinctly taught that the number *seven* was the common number of completeness. Consistently with this, then, it would seem that he could not avoid admitting that the septinity in some way involved the trine—of the truth of which idea a very *small* portion of the existing evidence is spread through the foregoing pages.

The doctrine of Degrees of altitude, then, in the light of principles heretofore established, and which doubtless Swedenborg himself would have admitted, may be presented in the following modified form :

Let each component gradation in the seven-fold series be called an *Elemental* Degree.

Let each Trinity of Elemental Degrees (the Primary and Secondary Trinities, as distinguished in foregoing pages) be called a *Discreet* Degree ; and

Let each seven-fold series, as a whole, be called a *Complete* Degree. We have thus Elemental Degrees, Discreet Degrees, and Complete Degrees.

For example, let the Mineral Kingdom be considered as one *Complete* Degree, the Vegetable Kingdom as another, and the Animal Kingdom as another ; while each Trinity of developments in each of those Kingdoms, as before represented, is considered as a *Discreet* Degree, and each member of each of those Trinities is considered as an *Elemental* Degree ; and the whole theory of Degrees of altitude will

appear in a general and particular form of embodiment that will be intelligible to most minds. .

Each *Complete* Degree, viewed in this light, will appear connected with the contiguous Complete Degree, in the same way as each *Discreet* Degree is connected with its contiguous Discreet Degree, and as each *Elemental* Degree is connected with its contiguous Elemental Degree; so that Nature, as a whole, will exhibit the same ascending order of *Complete* Degrees (or systems) that is exhibited by the *Elemental* Degrees composing any seven-fold series. I can not avoid the thought that this classification of Degrees, duly understood, would present a new and important aid to a proper comprehension of the *ensemble*, as well as the *particulars* of nature, with her forces, modes of operation, and mutual relations of parts.

In view of the *circular* constitution and order of procession of each system of being, as illustrated in the chapter immediately preceding this, we are prepared to further remark, that Degrees of altitude of each of these kinds, result from a *spiral uprising*, so to speak, of the circle of development, by which the first *Elemental* Degree ascends to the altitude of the second, the second to the third, and so on; or by which the first *Discreet* Degree progressively rises to the altitude of the second, and the second to the third, and by which one whole *circle* of developments, in being completed, thus forming a *Complete* Degree, passes out into another and *higher circle* or Complete Degree. For example, one octave in music, which may be considered as a series of *Elemental* Degrees of sound, forms one Complete Degree of sound, and each other octave forms another Complete Degree, superior or inferior to it, according as it is above or below it; and a similar remark is applicable to the Mineral, Vegetable, and Animal Kingdom

before referred to as contiguous and *Complete Degrees* of creation, the higher of which arise, in some sense of the term "progression," out of the lower.

Of these latter Kingdoms it may be said, that they are all in *accord* with each other, as different octaves in music having the same key-note. In other words, each Complete Degree, Circle, or Kingdom, seems to be, member by member, an exact counterpart of the others, on a higher or lower scale; and this may be said of many other Complete Degrees. A Complete Degree, however, may take its rise any where along the circle of an antecedent Degree, in the same way as *any* note in an octave may be taken as the initial note of another and independent octave. For example, it was shown in preceding pages, that the seven-fold series of outer terrestrial developments, as mentioned by *Moses*, commenced upon the basis of the *third* development in the comprehensive geognostic series, which had been before described; and many more examples of a similar kind might be given were it necessary. But however the key-notes of different octaves (or Complete Degrees) of natural developments may differ, the octaves themselves all contain the same number of parts, which have similar relations to each other, and occur in the same order of succession; and therefore all are governed by the same serial and gradational law.

The doctrine of Degrees might receive a much more extended illustration and application than is exhibited above, but as our object should first be to establish *general principles*, the foregoing must suffice for the present. Owing to its novelty and somewhat abstruse nature, this doctrine may, to the ordinary reader, be at first somewhat difficult of full comprehension; but I can confidently assure him, that if, by the little perseverance of mental effort that will

be required, he succeeds in mastering it, he will find that it will greatly simplify and facilitate investigation in every other department of thought, whether in physics, psychology, theology, or as relating to any of their numerous cognate subjects.

CHAPTER XXI.

THE DOCTRINE OF CORRESPONDENCES.

As a natural sequence of the doctrines of Serial Circles, and of Degrees, as presented in the foregoing pages, arises that doctrine of CORRESPONDENCES which has been the guide to so many important conclusions set forth in this work. All perfect Series, Circles, or complete Degrees involved in the system of creation, must, of course, proceed from the same final Cause; and as they must thus correspond to the common final Cause, they must hence, in some way, correspond to each other. Moreover, every complete Degree in the character of a Circle, necessarily involves the same principles of constitution with all other Circles, and therefore must, in the *general* sense, correspond to all others, whether they be on a higher or lower scale. And as each circle consists of the same number of parts, which occur in the same order of sequence and relations, so each *part* of any circle corresponds, in the general sense, to the similarly disposed *parts* of all other circles. Thus it is, that if we acquaint ourselves thoroughly with the characteristics and interior principles of any complete circle or Degree in nature, we may, in a general way, make it the exponent of all other circles or complete Degrees. But in order to pursue this correspondential method of investigation to the best advantage, and with the most accurate results in the way of eliciting truth, we must, of course, have a due regard to the relative positions in the whole grand scale or

Circle of creation, occupied by the two circles which are the special terms of comparison, and to the peculiarities of quality and development incident to their respective positions.

The comparison exhibited in foregoing pages, between Primary and Secondary Trinities, or Discreet Degrees, as they were subsequently called, shows that there exists also a general and particular correspondence between them ; but this correspondence is not so perfect as that which exists, generally and particularly, between the *Complete* Degrees or *Octaves* of natural unfolding.

It may, moreover, be said that any two creations, forms, or developments, which involve the *same principles* of constitution and operation, correspond to each other, however various may be the specific departments of existence in which they may be found. An identity of *principles*, indeed, is the essential basis of correspondence between higher and lower, or between ulterior and prior developments ; and in the light of this fact, all forms and developments in the material and exterior world may be seen to correspond even to things of a *spiritual* nature ; and things of a spiritual nature may, on the other hand, be seen to correspond to them. Indeed, if the science of Correspondences were duly developed, nature would appear as if invested with ten thousand tongues, which would continually be vocal with instruction. Every kingdom and form ; every shrub and tree ; every leaf and flower ; every insect, beast, and bird ; nay, every point of compass and angle of direction from any given point, and every curve, circle, spiral, or other mathematical figure, would speak a distinct language, and discourse of a separate truth ; and the whole grand system of Nature as One, would continually discourse of its Infinite Divine Author, of whose creative Wisdom and Love it is but an outer expression and correspondent !

The doctrines of Series, Circles, Degrees, and correspondences, therefore, if properly developed and understood, would be the most efficient of all possible aids to the discovery of that grand system of general truth whose millions of parts are all harmonious, mutually explanatory, and corroborative, of each other. Let the leading minds of the age, then, bestow due attention upon the development of these principles of investigation; and in proportion as they are comprehended and applied in the world, the conflicts of the various parties in philosophy, theology, and even politics, will be swallowed up in one grand and harmonious system of thought, the credentials of whose truthfulness will be borne upon its very face, to be seen and read of all men. With the aid of such a system, properly unfolded, even the child might set out on its course of progression, with the *unadulterated* truth, and even the *whole* truth—which, though at first in a diminished form of representation, and involved in comprehensive generals, would, as the mind expanded, gradually magnify, and regularly and harmoniously unfold into particulars, for ever and ever. The harmony of thoughts thus brought about in the world, would, in proportion to its degree, be necessarily accompanied with a more intimate and spiritual conjunction with the Divine Source of all harmony, from the perpetual inflowings of whose Love and Wisdom, all the movements of human society, in common with the movements of those planetary and celestial spheres which now, without reservation, own the Divine sway, would proceed without a jar, or a single note of discord. This would be the long-looked for, and long-prayed for, reign of God upon earth!

CHAPTER XXII.

THE DOCTRINE OF PROGRESSIVE DEVELOPMENT.

ONE important object of this treatise, as doubtless has been observed, is to exhibit the connection of nature with her interior, producing Cause, and pervading Life-force. The reader who has attentively followed us in the previous discussions having a bearing upon this subject, has observed that our philosophy has uniformly tended to the idea of an intelligent, voluntative DIVINE AGENCY, as concerned in the origin and government of the outer system of things. But as our object should be to discover truth for the sake of truth, irrespective of its character or consequences, it would be manifestly inconsistent to ignore any facts or manifest principles of nature which have been thought by any party in philosophy to militate against conclusions such as those exhibited in our previous reasonings. As the next natural step beyond the foregoing investigations, therefore, we proceed to briefly notice the merits of a pending controversy, embracing, substantially, the questions, *whether the system of nature is the result of the operation of an inherent force or law of progressive development? or whether it is the result of a series of special and independent exertions of Divine Power, with little or no regard to law?* Though these questions suggest two opposite views, neither of which we are able to adopt without some important qualifications, it is proper that they should here be exhibited, together with the main features of the discussions

they have engendered, in the form in which they have extensively occupied the minds of philosophers and theologians of late years; and it may be, that in the light developed by their conflicting affirmative and negative arguments, a *true modified* theory will be brought into view.

A few years ago there was published an anonymous work, entitled, "VESTIGES OF THE NATURAL HISTORY OF CREATION," in which the idea that creation is the natural result of the operation of certain fixed laws, is ingeniously maintained. Though the author of that work does not reject the idea of a *remote*, he rejects that of an *immediate*, Divine Agency, as concerned in the generation and government of the outer forms of nature; and as his positions, *viewed in one light*, present, unintentionally, perhaps, on his part, a condensed synopsis of the whole groundwork of the pantheistic and materialistic philosophy, it is proper that they should here be summarily exhibited.

Assuming the correctness of the nebular theory of cosmical creations (after epitomizing, in a cogent and felicitous manner, the prominent points of evidence on which this theory is based), the author urges this theory as exhibiting a succession of *law-governed changes*, by which primordial matter was resolved into stellar systems, solar systems, and planets, with all their present general and particular movements in space. The facts in Chemistry and Geology are then considered, as showing that the present structure and physical arrangements of our globe (together with all similar globes in space) originated, probably, from laws governing solid, fluid, and vaporiform substances.

The progressive and law-determined development, also, of *organic* beings, both in the vegetable and animal kingdoms,

with man at their head, is then maintained by arguments, of the more important of which, the following is a brief synopsis. ●

1. "We have seen powerful evidence," says the author, "that the construction of this globe and its associates, and inferentially that of all the other globes of space, was the result, not of any immediate or personal exertion on the part of the Deity, but of natural laws, which are the expressions of his will. What is to hinder our supposing that the organic creation is also the result of natural laws, which are in like manner an expression of his will? More than this, the fact of cosmical arrangements being the effect of natural law, is a powerful argument for the organic arrangements being so likewise; for how can we suppose that the august Being who brought all these countless worlds into form by the simple establishment of a natural principle, flowing from his mind, was to interfere personally and specially on every occasion when a new shell-fish or reptile was to be introduced into existence on *one* of these worlds?" The writer further argues that, "to a reasonable mind, the Divine attributes must appear, not diminished or reduced in any way, but infinitely exalted, by supposing a creation by law."

2. The writer submits that the progressive succession of organic beings, as revealed in fossilology, by which the lower and more simple forms, as a general rule, precede the higher and more complex, is in perfect harmony with the hypothesis of development by *law*; whereas, on the supposition of special Divine exertions, it might be supposed that there would have been many specialities of Divine creation, as essentially modifying the existing order of things.

3. Particular facts and analogies, as connected with the organic kingdoms, seem to hint that forces are lodged in nature

from which the simpler species in the vegetable and animal world may, under certain circumstances, derive their origin. Reference is made to the vegetable-like forms of frost on the window, and to the shrub-like form of crystallization known to chemistry as the *Arbor Diana*—also to the vegetable-like forms of some of the ordinary appearances of the electric fluid; and from these phenomena the writer argues the probability that electricity is largely concerned in the origination and growth, not only of crystals, but of plants, which assume forms according to specific generative and other conditions. Moreover, the growth of certain plants for which no seeds were sown, and in situations where it is next to impossible that such seeds could have existed, is thought to add probability to the theory of a possible spontaneous germination of vegetable forms without the ordinary seminal mode of origination—provided such changes are suddenly made in the ingredients and conditions of a soil as are favorable to the development of organic from inorganic forms. The author also mentions the singular facts that oats cropped down so as to prolong the period of their growth, have been known to progress, by regular transmutation, into the form of rye; and that the cabbage is known to be, in its native state, a trailing sea-side plant, totally different from the plant in its cultivated form. These latter facts, with others, are thought to strongly support the theory of a *transmutation* of species from lower to higher forms.

4. The formation of entozoa, or animals within animals, where their eggs could not possibly have been deposited, is thought to argue powerfully for the independent generation of the lower animal forms, when certain conditions obtain that are favorable. This argument is thought to be strengthened by the fact that insects of a low species (the *acar*) were repeat-

edly produced in abundance, apparently solely by galvanic processes instituted by Messrs. Crosse and Weekes; and in one instance, a growth of fungi of a beautiful and previously unknown species, was produced by the last named gentleman, by the same process.*

5. Particular features of animal organization, which are apparently useless and incidental, are also adduced in support of the same theory of law-development. Thus female animals of many species have certain organs which are *necessary* to their sex; while the same organs exist *rudimentally* in the males, to whom they are *not necessary*. "For example," says the writer, "the mammæ of the human female, by whom these organs are obviously required, also exist in the male, who has no occasion for them. It might be supposed that in this case there was a regard to uniformity for mere appearance sake; but that no such principle is concerned, appears from a much more remarkable instance connected with the marsupial animals. The female of that tribe has a process of bone advancing from the pubes, for the support of her pouch; and this also appears in the male marsupial, who has no pouch, and requires none." Other animals, and especially among those which form links between lower and higher orders in the scale of development, have the rudiments of organs, to them unnecessary, but which were necessary to animals beneath them in the scale; but of facts of this kind I need not give further details. These abortive and rudimentary organs, ex-

* These alleged results of the experiments of Messrs. Crosse and Weekes, were at first almost universally scouted as absurd and impossible; but subsequent repeated experiments, performed during several years, seem to leave no doubt of their reality. I perceive by a late communication, published in the newspapers, from Mr. F. F. Ogden, United States Consul at Liverpool, that that gentleman has recently visited the laboratory of Mr. Crosse, and became entirely convinced of the truth of the wonderful representations concerning this newly produced insect.

isting where they are not necessary, must, it is thought, be regarded as blemishes and blunders, on the supposition that the beings who possess them were created independently and by special exertion ; but they are considered as precisely what might have been expected on the supposition that creation has proceeded through her various ramifications and transitional stages, according to the energizing and directing influence of a uniform law of development.

In further illustration and support of the theory of progressive development, the writer quotes the following startling passage from *Fletcher's Rudiments of Physiology*, in which it is shown that the general forms, and the order of succession, of the developments in the animal kingdom, are represented by the general forms, and the order of succession, of the developments of the human fœtus. "It is a fact" (says Dr. Fletcher), "of the highest interest and moment that, as the brain of every tribe of animals appears to pass, during its development, in succession through the types of all those below it, so the brain of man passes through the types of those of every tribe in the creation. It represents, accordingly, before the second month of uterogestation, that of an avertebrated animal ; at the second month, that of an osseous fish ; at the third, that of a turtle ; at the fourth, that of a bird ; at the fifth, that of one of the rodentia ; at the sixth, that of one of the ruminantia ; at the seventh, that of one of the digitagrada ; at the eighth, that of one of the quadrumana ; till, at length, at the ninth, it compasses the brain of man. It is hardly necessary to say," continues the writer, "that all this is only an approximation to the truth ; since neither is the brain of all osseous fishes, of all turtles, of all birds, nor of all the species of any of the above order of mammals, by any means precisely the same ; nor does the brain of the human fœtus at any time

precisely resemble, perhaps, that of any individual whatever among the lower animals. Nevertheless, it may be said to represent, at each of the above-mentioned periods, the *aggregate*, as it were, of the brains of each of the tribes stated."

Although these facts were stated by Dr. Fletcher without any view to the support of the development-hypothesis now under consideration, it is remarkable that the series of animal forms which he here traces as representing the series of successive human foetal developments, is the very series which, in the same order of succession, made their appearance on the globe during the depositions of the fossiliferous rocks from the earliest to the latest.

The foregoing are the principal arguments, fortified by many minor facts and considerations, from which the author of the "Vestiges" concludes that the whole system of creation, with all its diversified forms, inanimate and animate, from its first to its last stage of unfolding, was brought forth under the operation of one grand law of progressive development, by which "*the simplest and most primitive type gave birth to the type next above it,*" by which "*this, again, produced the next higher, and so on to the very highest, the stages of advance being in all cases very small—namely, from one species only to another, so that the phenomenon has always been of a simple and modest character.*" He considers that after the production of the first and lowest animal form, the higher type was, in all cases, produced from the lower, according to the ordinary process of generation, and that its superiority to its parent was, in each instance, owing to a prolongation of the process of utero-gestation, aided by new and favorable circumstances, by which the form next superior to the parent, in the pre-ordained animal scale, was attained. A similar principle of transmutation was applied also to the Vegetable

Kingdom, by which it was thought that higher forms ascended from lower, until the highest were attained.

A theory so novel and startling as the foregoing, did not, of course, escape the most vigorous opposition from adherents of prevailing theories in philosophy and theology. This opposition was specially inspirited by the alarm which was taken by the dominant theology, which considered the theory in question as a bold invasion of her assumed prerogative as a generally unquestionable guide in matters of religious faith. The main features of this opposition (which, we think, was partly just and partly unjust) require here to be briefly represented, together with the essential points of argument in the rejoinder which the opposition called forth from the author of the "Vestiges."

The book in question was charged with a "direct tendency to expel the Almighty from the universe which He has made—to degrade the god-like race to whom He has intrusted the development and appreciation of His power, and to render the revelation of His will an incredible superstition;" and, probably with quite as strong a desire to neutralize this alleged tendency considered in the abstract, as to develop truth regardless of its consequences, its essential idea was pronounced "an opinion which has not a single fact in its favor—which stands in direct opposition to all the analogies of nature—which is repugnant to the best feelings of mankind, and subversive of all our most cherished convictions—a fraud committed upon the reason, and an insult cast upon the dignity of our species."*

The zeal of the prominent opposers of this work, and their

* North British Review for July, 1845.

devotion to the one grand object of putting it down, as indicated in these and similar denunciatory expressions, may, in some instances, have caused them to unconsciously magnify the seeming evidences against the theory it propounded, and as unconsciously to underrate any real evidence which may exist in its favor. Candor requires, therefore, that we should look at the merits of this, as well as of all controversies of a similar nature, aside from all mere denunciation such as novel theories, true or false, are ever apt to provoke—and in the light of the plain facts and arguments which bear upon the case, by whichsoever party these may be urged.

The nebular hypothesis of cosmical creations urged by the author of the "Vestiges," as the initial portion of the universal system of creation supposed by him to be unfolded by law, was objected to mainly on the ground that the Earl of Rosse's telescope had succeeded in resolving into stars certain nebula which were before considered irresolvable, and in considerably changing the apparent form and outlines of others, which had previously appeared such as to countenance the idea of agglomerating and rotating masses. In view of such "unequivocal facts," one principal reviewer regards it as a "most unwarrantable assumption to suppose that there are in the heavenly spaces any masses of matter different from solid bodies composing planetary systems." To this our author replies that the resolution of a great quantity of previously unresolved nebulae, by Lord Rosse's telescope, "was, of course, to be expected, and it is a fact, though in itself interesting, of no consequence to the nebular hypothesis." There are still many nebula which even the stupendous powers of Lord Rosse's instrument do not sensibly affect, and which probably no increase of optical power ever to be attained by human science or art, would be adequate to resolve. But the present

position of the nebular theory in respect to its philosophical credibility, is more fully represented in a previous portion of this work.

The theory of progressive succession in the organic kingdoms, as advocated by the "Vestiges," is disputed mainly on the following grounds: First, that fishes of a high organization occur (as it is said) in the oldest of the fossiliferous rocks; secondly, that in several instances the passage from a lower to a higher system of rocks, is accompanied by an abrupt and entire transition in the organic kingdoms, exhibiting none of the links of progressive gradation which the theory of the "Vestiges" supposes to exist; and thirdly, that in some instances several widely different and previously unknown species seem to have been introduced at about the same epoch, with apparently no links of connection between them.

To the allegation that fishes of a high organization occur in the *oldest* of the fossiliferous rocks, the author of the "Vestiges," in his sequel to that work, replies by quotations from geologists, showing a discrepancy in their statements upon this point, which, however, he shows may be explained by the fact, that since the statements of *some* of them were put forth, "the lower fossiliferous rocks have been divided into several distinct formations, in the lowest of which it is fully admitted there are no vertebrata. He, moreover, argues that the cephalopoda and gasteropoda, mollusks of a high organization, whose remains are found in the oldest series of fossiliferous rocks, might, as transmuted species, have come in soon after the commencement of the formation of those rocks, as owing to a "rapidity of generation" and "rush of life," which is sometimes characteristic of certain of the lower orders of animals.

In answer to the argument which negatives the idea of

connecting links between lower and higher species, and between widely dissimilar species existing in the same system of deposits, he *generalizes the field* of geological observation, and finds particular systems, both of rocks and their contained fossils, more fully and particularly represented in some localities than others. By the facts which he develops in this branch of the discussion, he succeeds in materially weakening, though perhaps not entirely disproving, the assumptions of his opponents, that the character of organic life has been subject to frequent abrupt and entire changes. He considers it probable, moreover, that "development has not proceeded, as usually assumed, upon a single line, which would require all the animals to be placed one after another, but in a *plurality of lines, in which* the orders, and even minuter subdivisions of each class are ranged side by side;" and he argues that "the development of these various lines has proceeded independently in various regions of the earth, so as to lead to forms not everywhere so like as to fall within our ideas of specific character, but generally, or in some more vague degree, alike."

Upon the whole, the author reasserts his main position with so much force and ingenuity, and brings to it such an accession of evidence from the testimonies of geologists and naturalists, as apparently to render the general onslaught of his opponents, for the most part, a failure; and perhaps it would not be unfair to consider their subsequent silence as, in some degree, a tacit admission of this fact.

Though the author of the "Vestiges" acknowledges that God is, in some sense, ever present with his creation, and supports and rules it by his Providence, he admits this merely as the intimation of an internal sense or feeling, for which he does not pretend to have any philosophy. But in the absence

of such a philosophy, those who *have not* this internal feeling of the presence and overruling Providence of God (as many have not), very naturally employ the whole force of facts and arguments, such as have a very thorough development in the book referred to, in support of the idea that nature develops all her forms and phenomena, by an inherent force of her own, independent of any superior influence, as received from a Source *without* herself. . Such theories can, of course, be successfully met only by the weapons of a cogent and well-grounded philosophy, as relating to the matters in dispute; but as such a philosophy does not yet prevail, to any extent, in the world, it hence follows, as a fact much to be lamented, that faith in God and his overruling and universal Providences, is, to a large extent, at the mercy of pantheistic and materialistic philosophies. Such philosophies are hence continually growing more rife and rampant; and when those who know *for themselves*, from *intuition*, that there is a God ever present with, and ever ruling, the affairs of creation, find themselves incompetent to meet the arguments for the opposing views, they are apt to grow impatient, and to descend to mere ridicule and denunciation, and sometimes even to misrepresentation—a mode of treatment which seldom fails to excite the contempt of those toward whom it is aimed, and even to confirm them in their anti-religious theories.

Common sense should teach every one that it is worse than useless—nay, perverse and wicked—to close his eyes to plain facts in nature, *whatever* may be their apparent theological or philosophical bearings; and whoever would do such an act, is plainly not so much devoted to the furtherance of *truth* as he is to the maintenance of his own opinions. Looking fully in the face, therefore, as in duty bound to do, all the clearly established facts exhibited by the “*Vestiges of Creation*,” as

well as every other species of fact, let us see whether the general philosophy of this work will afford any light by which outer appearances, reflecting a natural law or force of development, and the interior sense of the human soul, respecting the constant presence of God, and the exertion of his upholding and directing power, may be rationally harmonized. By way of attempting the solution of all apparent discrepancies, as involved in these subjects, we will, in the following pages, endeavor to unfold the true theory of law agency and Divine agency, as it appears to us.

CHAPTER XXIII.

FURTHER VIEW OF THE SYSTEM OF LIVING FORMS, AS SUGGESTING ITS MODE OF DEVELOPMENT

HAD the author of the "Vestiges of Creation" and his opponents both understood the doctrine of Series, Degrees, and Correspondences, as unfolded in the preceding pages of this work, and had they duly observed the indications of these doctrines in regard to the origin, constitution, and laws of nature, the relations of visible effects to invisible and spiritual causes, and the relations of the universe and all its sub-serial and corresponding parts, to the Infinite Divine Spirit, as the Projector, Originator, and Vitalizer of all, they might, by a *mutual*, and in that case *obviously required*, modification of their views, have come to a perfect agreement on all essential points, without compromising any true principle of theological faith, or disregarding any real fact in science or true principle in philosophy. The view which, as it appears to me, reconciles all real scientific facts, and all true philosophical and theological principles, I will now proceed to briefly unfold.

I will premise by saying that the idea of *progression*, as a general fact connected with the origin and movements of creation, as a whole, and with the origin and movements of each of its sub-serial and correspondent parts, seems to be necessarily involved in the idea of successive movements or unfoldings, from beginnings toward predetermined ends. Every successive movement or effort is a closer approximation

to the proposed end of the whole series of movements, and is therefore a decided progress from a previous and more rudimentary state or position. Accordingly all philosophy and all revelation concur in the acknowledgment that creation, from its incipient to its present stage of development, has passed through a regular series of progressive unfoldings; and this fact is recognized as applying equally to the cosmical universe, to the geological formations, and to the various systems of organic forms, beginning with the lowest and ending with the highest, whose remains have been successively entombed in the rocks.

It is true there are occasional and apparent exceptions to this rule—occasional instances of particular retrogression on the one hand, and irregular and abnormal advances on the other; but these are owing to local circumstances and isolated influences, and when properly understood, they *prove*, rather than *disprove*, the general rule. The idea may be illustrated by the following simile: Let a number of vessels, of different classes, be supposed to sail from the same port, at the same time, and bound to the same place of destination. Wafted by the same breezes, and floated by the same tides, they, for a time, make nearly equal progress, sail in nearly parallel paths, and generally keep each others company. But owing to slight diversities in their sailing qualities, and incidental differences in their modes of manœuvring, their courses gradually diverge from each other, and they get into different currents of ocean and of atmosphere, some of which are propitious and some the reverse. They are then farther dispersed by hurricanes; some of them, by violent gales occurring only in their own localities, may be driven hundreds of miles out of their course, or in a retrograde direction; a few of them may be driven upon rocks or quicksands, and lost out

right; while others may be driven forward with equal violence, and reach their destined haven in an apparently irregularly short period of time. Of course no one would consider the diversities in the fates and successes of these different vessels, or the fact that some were for a time driven backward, that some were lost outright, and that others were driven forward with a velocity which seemed to set all idea of a regularly graduated motion at defiance, as any proof against a general law of progression, as applied to the sailing of ships from port to port, but the proof would, upon the whole, be the reverse.

Allow these ships, then, to represent an equal number of Divine archetypes, or pre-existing ideal forms of creation, so to speak, which set out, at one and the same time, upon the voyage of progressive development, all being bound to one haven, viz., the realization of the clothing of an exterior form; the diversities in their movements, presented in the retardations and temporary retrogressions of some, and the fitful and apparently preternatural accelerations of others, as owing to the various currents and counter-currents of outer influences, no more disprove the law of *general* progression, with reference to them, than similar diversities of movement prove the same thing with reference to the ships. When we, therefore, find a few local examples of vertebral fishes among some of the strata of the first series of fossiliferous rocks, or when we find, in one or two instances, the remains of a diminutive air-breathing reptile, in an upper member of the Old Red Sandstone series, where, as it is stated, such have recently been found;* or when, in human history, we find examples of whole nations and races remaining apparently stationary for thousands of years, while others have, at early

* See Edinburgh Philosophical Journal for April, 1833, pp. 353-4.

periods, come to a high state of advancement in art, government, and social refinement, which were again succeeded by universal ignorance and barbarism—we are not to consider these examples as contradicting the doctrine of progression, as a *general* principle, but as only the *particular* and *local exceptions* to the *direct* development of that principle in outer forms.

Keeping in view, then, the doctrine of general Progression as an undeniable principle applicable to the universal series of creation as a whole, and to all its included and corresponding sub-series, we are prepared for further inquiries respecting the *order* and method of progression, and the mutual relations of the different parts or degrees of each series of creation to which this principle applies. In making these inquiries, our attention will be confined for the present to the Animal Kingdom, which will serve as a representative of all other serial creations.

The fact alluded to by the author of the “Vestiges of Creation,” that in the reproduction of the higher animals and of man, the embryo passes through successive stages of development, in which the types of all the lower animals, beginning with the fish (or, as some say, with the annalid or worm), are represented in succession, until its own proper type is attained, is certainly of great significance, as it bears upon the subject under consideration. But Professor Agassiz has made some further discoveries in the department of embryology, which would perhaps go to emphasize the conclusions to which this fact would seem naturally to point. I would refer now particularly to the discovery that the embryos of animals of certain *existing* families bear, at a certain stage of their foetal progress, a distinct resemblance to the perfected individuals of now *extinct* species of the same families, which existed in

early geological periods. From his remarks on this subject, I submit the following quotations :

"Embryology," says he, "by the metamorphoses which take place in animals, assigns now a value to external forms, and not only assigns them a value, but a chronological value, by which it is possible to consider as lower those animals which agree with the earlier forms of the germs."

"The class of fishes which I have studied more particularly, has shown me that the first types appeared under forms, and with an organization, peculiar to *embryos* of that very class in the present epoch, proving thereby, with perfect evidence, the inferiority of the first created types, as well in their peculiar class as in their department. But though of a lower order, these types of ancient ages bore in themselves, from the beginning, the impression of the plan that was to be successively developed in the different epochs which have preceded the order of things existing at present, and by whose realization have been brought about those numerous families of Fishes, Reptiles, Birds, and Mammalia, which now live upon the surface of the earth." Again: "All the information about the fossils—all the information of former ages, will have to be compared with those embryonic forms, in order to understand more fully the analogy which exists between these earlier types, and the successive changes which those of our day undergo to assume their final form. If I am not mistaken, we shall obtain from sketches of those embryonic forms, more correct figures of fossil animals than have been acquired by actual restoration."*

These extracts from one who is an advocate of the idea of creations *de novo* at different geological epochs, certainly argue

* Agassiz's "Lectures on Comparative Embryology," delivered before the Lowell Institute. Boston. Lec. xii.

much for a connection of *some* kind between the lower and higher, or extinct and living, species of animals of the same families, and pretty clearly show that the higher and existing species are, in many instances, the result of an *extension of the identical gestative process* which, in its lower stages, was exemplified in the ancient species. Such being the existing evidence of a connection between ancient and modern species of the same families and genera, and that the modern species exist, at least as a progressed sequence of the *principles* involved in the ancient, we will now quote from the same author some further illustrations of the analogies and connections existing between the different and successively created divisions of the Animal Kingdom as a whole, with man at its head :

“The unity of structure in vertebrated animals,” says he, “has been understood, and well understood, long before Embryology had added any thing to show how deep this unity of plan was impressed on that type. By the investigations of Comparative Anatomy, it had been ascertained that the external differences which characterize the class of Fishes, that of Reptiles, that of Birds, and that of Mammalia, were only modifications of one and the same structure—that the head of Fishes, for example, though apparently so different from that of Man, was made up of the same bones, arranged in the same manner, only sub-divided into more distinct points of ossification, with modified proportions, most of them remaining movable for life, but, after all, arranged upon the same uniform plan.”

In a previous paragraph, the same author says: “It was in Physiology, a great discovery, when it was ascertained that all Vertebrata, that Fishes, as well as Reptiles, as well as Birds, as well as Mammalia, arose from eggs, which have one and the same uniform structure in the beginning, and proceed

to produce animals as widely different as they are in the full-grown state, simply by successive, gradual metamorphoses; and these metamorphoses upon one and the same plan, according to one and the same general progress." Again: "It may therefore be said, with perfect propriety, that the higher Vertebrates undergo changes, through which, in different periods of their life, they resemble the lower ones; that there is a period when the young bird has not only the form, but the structure, and even the fins, which characterize the Fish. And of the young Mammals the same may be said. There is a period in the structure of the young Rabbit (in which the investigations have been traced more extensively than in other species), when the young Rabbit resembles so closely the Fish, that it even has gills, living in a sac full of water, breathing as Fishes do. So that the resemblance is as complete as it can be, though each of these types grows to a complication of structure, by which the young Mammal, for instance, leaving behind this low organization of the lower types, rises to a complication of structure, to higher and higher degrees, and to that eminence even which characterizes mankind."*

These facts certainly show a unity of plan and a progressive succession of, in *some* sense, mutually dependent forms, in the system of animated nature, which countenances the idea that the whole creation of lower animals is, as it were, the *fetus* of the whole human creation, and that the latter was thus developed by a process somewhat resembling that which the author of the "Vestiges of Creation" supposed to have taken place, and which he calls "the universal gestation of Nature;" yet we shall soon see that, so far from this theory dispensing with the agency of a God, this universal gestative process could not have proceeded even through its first stages, without

* Lectures on Comparative Embryology, Lec. xii.

the constant influx of a vitalizing and energizing Influence from above all nature, and hence from a source absolutely Divine.

It may here be remarked that these facts, developed by the researches of palæontologists, embryologists, and physiologists, concerning the relations and order of succession of the different divisions of the animated tribes, *are in perfect agreement with the general mode of philosophizing presented in this work*, by which all general facts in each system of creation, and all systems of creation as *grand facts*, are arranged in a harmonious serial order of progression, in such a way as to show a thread of unity and correspondence running through all systems, and through the grand system of systems, from the very origin to the very ultimates of all things.

This scheme of creation brings the Animal Kingdom, as well as the Vegetable, and all other complete systems of creation, together with the grand System of all systems, under the analogy of a **TREE**, with its seven serial and progressive parts, consisting of Roots, Trunk, Branches; Leaves, Flower-buds, Blossoms, and Fruit. It is thus strongly hinted that the whole universal System of creation, with all its corresponding sub-systems, including the Vegetable and Animal Kingdoms, while *under the constant vitalizing and voluntative influx of Divine Love and Wisdom, which are spiritual Heat and Light, grew up*, as it were, *from Germ to ultimates*, in the same progressive and sequential order in which the tree grows from root to fruit, under the constant influx of *solar* heat and light, which are the *natural correspondents* of Divine Love and Wisdom.

But if this view is admitted, it will not of itself necessarily decide the question as to whether each higher creation was in all cases developed "from the parentage of the one immedi-

ately below it in the series to which it belongs. There is, apparently, one exception to this order of parental extraction in the developed parts of the superiorly organized tree: The flower-buds, though they are the next superior development to the leaves, are not an outgrowth from the leaves, but, in common with these, they are the next superior outgrowth from the branches; and the leaves, after performing their specific functions, die and drop off, without giving rise to any succeeding and superior form of developments. The flower-buds are undoubtedly an ascension of the same essences and principles which, stopping one step short of them, produce the leaves, and which, in each case, ascend from all the preceding developments of the tree as represented in roots, trunk, and branches.

It should be remarked, however, that in a less perfect class of vegetable forms—the cryptogamia—the organs of fructification, involving, of course, the principles of the bud, are developed *upon the leaves*, which, in this instance, shows the relations of parent and offspring between the two developments, and preserves the succession between them unbroken.

Concerning the genesis of the Animal Kingdom, then, as well as that of all other Series and Degrees of creation, it may, so far as the known analogies of nature are concerned, and without in either case affecting our views of the Divine agency, be consistently believed, either that the higher tribes in the Animal Kingdom (as well as in the Vegetable and other Degrees of Creation), at certain periods, and under certain revolutionary conditions or Divine impulsions hereafter to be explained—*proceeded by orderly descent, from the tribes next below them, as their natural parents*—or that they proceeded, at the same periods and under the same conditions,

from the aggregate of all preceding developments of nature, as constituting their general material germ, while they had no *special* lineal connection with the forms next below them in the series. Either of these suppositions would sufficiently comport with the unity of the general plan which we have before observed to pervade the works of creation. The probability is, however, that *both* of these modes of production were, to some extent, observed in the origination of the *ensemble* of the Animal and other Kingdoms; but in neither case is it probable that any form or creation was unfolded, except upon the basis of a suitable preceding development, which, in some sense, served as its material germ, or predisposing condition of development.

Unless we adopt some such theory as here propounded, many natural facts—facts which the cause of *true* theology and religion can never be subserved by denying—will remain entirely inexplicable.

CHAPTER XXIV.

LAW AGENCY AND DIVINE AGENCY.

IN the light of the foregoing remarks respecting the order, successive developments, and relations of the organic tribes, let us now press to a final and more specific decision, the question, whether the system of Creation, as it now stands, came to exist, in any sense, through the operations of Law?—and if so, in what sense, and with what accompanying conclusions relative to the doctrine of Providences, or of Divine interpositions?

But that we may pursue this inquiry intelligibly, we must obviously first define precisely what we mean by the term "Law." Law, as it is understood by the best authorities, means simply a rule of action, or a definite mode or method in which force and motion proceed toward the accomplishment of an end. It is not, therefore, of itself, either force or motion, but only the *rule* of action which these, in their operations, are made to observe.

Now it may be safely asserted that there is no force or motion, either in the universe of matter or the universe of mind, which, in its operations, does not observe *some* rule, *some* method, and hence *some* law. If, indeed, there could be any action or motion *without* method or law, that action or motion would necessarily be chaotic, and would tend directly to the total subversion of all law and order, and thus to reduce all things to chaos. It is impossible for a man to conceive a

thought, except in accordance with some law of thought. Nay, it is self-evidently impossible even for the Infinite Mind to conceive a thought, or put forth an action, except in connection with some definite mode or form, and hence law, of procedure which that thought or action spontaneously assumes. In the Infinite Mind, therefore, Law, in its spiritual sense, is self-existent and eternal. Thence it proceeds, by volition, in outer creations, and assumes the forms of what are termed the "laws of nature." These, as modes, or rules of material motion, commence at the lowest and most chaotic germs of the physical universe, and (being constantly supplied by voluntative and *higher* inflowings from their Infinite Spiritual Source) proceed in regular order of ascending development, through all subsequent motions and creations, until, in the heights of the celestial universe, creation again merges itself in that Infinite Divine Essence from which it originally sprang. And as all motions are in accordance with some definite rule, method, or law, hence all forms, creations, and conditions, from lowest material to the highest spiritual and celestial, which, in regular serial orders, are developed *by means of* those motions, are necessarily law-developed and law-governed. If this were not so, then creation, indeed, would not exhibit *any* system or method in its arrangements, such as is now apparent throughout its whole domains, but the various forms of which it is composed, would necessarily be totally disconnected and confused.

It is worthy of remark, that the idea of law as governing the processes of creation obtains predominance in proportion to the development of the human mind. Thus the child conceives that the grass is made to grow by an abstract interposition of the power of God, with which he is unable to connect any idea of law. But as his mind unfolds, and the field of

his observation extends, he discovers that grass grows, in all cases, under certain given conditions, and hence grows according to a fixed rule. He still, perhaps, believes that God, by a direct and *isolated* fiat of His will, causes the rain to fall, the thunder to peal, and the lightning to flash; but a further development of his mind corrects this impression, and shows him that the rains, the thunders, and the lightnings, are dependent upon a more *general* administration of the Divine Power through atmospheric and electric media and conditions. He still, perhaps, imagines that the sun, moon, and planets are made to pursue their courses in the heavens by the direct volitionary effort of God concentrated specifically and abstractly upon them; but when his mind is introduced to the series of demonstrations presented in the science of Astronomy, he perceives that all these phenomena are in accordance with a general method in which all aggregations of matter in free space act. He still probably believes (according to a common, and, as we have before shown, an erroneous interpretation of Sacred Scripture) that the earth on which he dwells was directly spoken into existence by God, in the space of six literal days, about six thousand years ago; but when he attains a more enlarged understanding of the mechanical and chemical forces which God has incorporated in the system of nature, and reads the physical history of our planet as written upon the rocks, he perceives that our globe has been brought from a primeval chaotic, to its present perfected state, by means of fixed methods of operation of matter, expressed by the terms, "condensation," "abrasion," "deposition," "segregation," etc. And if the hypothesis (seemingly supported by all analogy) that vegetable, animal, and even *human* organisms, came to exist through the instrumentality of equally fixed and unvarying laws, is now met by storms of opposi-

tion and ridicule, it should be remembered that precisely similar opposition, based upon precisely the same grounds, attended a similar announcement when first made, with reference to the origin and *modus operandi* of many forms and departments of nature concerning which the announcement is now fully admitted to have been true; and the final triumphs of Astronomy and Geology over the dragon of *unscriptural*, as well as *unphilosophical*, opposition, which stood before their parents to devour them as soon as they were born, should stand as a warning against a too hasty decision unfavorable to law-developments, as applied to all other departments, organic and even spiritual, as well as inorganic and material.

Yet, when it is asserted that all things, as to their creation and functional operations, are within the governing influences of law, the sense in which we have defined the term "law," should be distinctly borne in mind; and for the sake of more explicitness on this point, as well as to show that our position involves no objectionable theological corrolaries, we will here submit a few more considerations respecting it.

I have said that Law is not of itself *force* or *motion*—hence, that it can create nothing or do nothing of itself; but that it is simply the *mode* or *rule* by which force and motion act. Hence, when we speak of the "law of Expansion," for instance, we refer only to a mode of operation among particles or substances, which is expressed by the term "Expansion;" when we speak of the "law of Gravitation," we only refer to that particular mode of action among materials which the term "gravitation" defines. And we have a similar meaning when we speak of any other law. But the *Force* by which the action, proceeding according to these various laws, is generated, remains yet to be accounted for; and this we will now attempt to do, at the same time that we attempt to illustrate how

modes or laws of action came to be such as we see them. The remarks now to be offered will, at the same time, illustrate the *direct* agency which God has in the process of creation, and furnish the foundation of a true understanding of the doctrine of Providence.

One feature of the present subject has already been presented, under an illustration which may again be called up, and carried out into further particulars. A builder, before proceeding to the outer construction of an edifice, first conceives the general plan, and ideally perceives the general appearance of that edifice in his own mind. This conception is the archetype or pattern according to which the edifice, as an outer object, is to be erected; and its erection is a mere clothing of the archetype or pattern, with outer material investiture. But this clothing of the archetype can not be accomplished except by the voluntative and energizing influence of the soul, spirit, or mind of the builder acting among the materials to be wrought into the physical structure, which action may be either through the medium of the builder's own muscles, through the minds and muscles of others, to whom his commands may be given, or through a suitable machine which he has previously designed and prepared. And when the building is thus erected, it stands as an exact correspondent and embodiment of that particular *form* and *degree* of intelligence and volition, which were requisite to the conception of its plan, and the conjoining of its materials. After the building is finished, however, the builder withdraws all further action and influence from it, and it is left as a mass of perfectly dead and motionless materials; but could he permanently infix in it such portions or degrees of his own energizing spiritual essence as would be requisite to keep it in repair, and to constantly refine and improve it, and to develop its ultimate

purposes, the building would in that case be a *living* creation.

Now it was logically proved, in another part of this work, that the Universe, or the whole great Kingdom of materiality which it comprises, is not self-existent and eternal, but that it as necessarily had a *beginning* as any human or other physical organism had—that it is therefore necessarily dependent upon an antecedent and correspondent existence as its Cause, which must have been, *not inferior*, but *superior*, to itself, even as the natural sun is superior to the plant which its beams cause to grow. Being thus superior to, and the cause of, the whole of material existence, we were forced to conceive of it as a *super-material*, *super-universal*, and hence *spiritual* Existence, of which intelligence, personality, and hence *Divinity*, are predicable.

This spiritual, intelligent, personal Divinity, whom we call God, then, being antecedent to, and the Cause of, the universal system of creation, and sustaining toward it the same relation which an earthly builder sustains toward a house proposed to be erected, must, in like manner, with the latter, have conceived in his own mind the archetypes or patterns of the universal structure, with all its included kingdoms, systems, series, degrees, species, and essential forms, from lowest to highest; before proceeding to clothe these with outer investiture. And as in the mind of the human builder, the archetypes of the proposed house are, as it were, the spiritual nuclei around which, by his own volitionary effort, the materials are made to cluster, and thus finally establish the structure as an outer creation, so in the mind of the Deity, the archetypes of the Universal Structure, of Solar Systems, of Geological Developments, of Mineral Kingdoms, Vegetable Kingdoms, Animal Kingdoms, and the universal Human

creation, with all the specific and essential forms which these respectively include, were the spiritual nuclei, and pre-existent, interior realities, around which, by the force of constant Divine volition, the requisite particles and essences are made to cluster, by way of establishing them in outer and tangible forms.

Now, both with the human builder and his house, and the Divine Builder and the system of the universe, the archetypes conceived in the mind, constituted the laws or rules by which outer materials acted in their aggregations into outer forms; while, in both cases, the *force* by which those materials were impelled to act at all, originated in the volition of the Builder. Here is the difference between *Law* and *Force*. Law of itself could not create any thing, though all things were created according to Law. Force of itself could not create any thing, though all things are created by the application of Force. It is by means of Force, as an impulsive principle, and Law, as a *director* of its impulsions, that all things have sprung into being.

The idea may perhaps be rendered still more clear to some minds, by considering the whole united system of archetypes as one grand *Mould*, fashioned in the wisdom of the Builder, into which, by the direct voluntative effort of the Builder, materials are poured, by way of forming the outer structure. But without the extra proceedings of pouring the materials into it, the mould might exist for ever without giving rise to the casting, while, on the other hand, all the efforts imaginable could not give rise to the casting, did not the mould exist to receive it.

We have seen that if the human builder, in clothing his mental archetypes of a proposed structure, could permanently infix in that structure that portion or degree of the energizing

influence of his own spirit, which would be requisite, by a spontaneous internal action, to keep the structure in repair, and at the same time to refine and perfect it, the structure would be, in some sense, a *living* creation. But although this is not the case with the human builder and his work, it is precisely the case with the Divine Builder and the universal Edifice which he has established. Not only does the system of creation as a Whole, but each of its included and corresponding sub-systems, contain a power of internal motion and sustentation, infused by the Creator at its origin, and which is now perpetually sustained by influx from Him, and is ever acting in parallelism with the original archetype, which constitutes its *law*. It was in view of this fact that it was argued, in another part of this work, in opposition to the received philosophy, that if the cosmical system could, by any foreign agency, become deranged or thrown out of equilibrium in any way, instead of the derangement progressing, and ultimating in a total wreck of the system, the internal forces of recuperation would be such as to soon restore the wonted equilibrium, and all things would go on as before. But on the other hand, were the Creator to withhold the influx of, and withdraw, his vital energy from the universe, as soon as the momenta of existing forces and motions became exhausted, all things would necessarily come to an eternal stagnation and death!

I have said that the archetypes or pre-existent ideal patterns of each creation, are the *spiritual nuclei* of the outer forms of which that creation consists, and hence that they constitute the *laws* by which Force acts in the aggregation of substances for the development of their outer forms. Now, as it was before shown that each creation, both as to its exterior and its interior and vitalizing constitution, is seven-fold, so each creation, with its spiritual nuclei, life, and laws, is, in some

sense, a correspondent and representative of the seven-fold constitution of the Deity, or the "seven spirits of God" spoken of in Revelation. Each seven-fold creation, therefore, is the same with all others as to *correspondence*, but is different from all others as to *degree*; and each one contains within itself, as its vitalizing and energizing soul, a *corresponding degree* of the seven-fold harmonies of Divine Love and Wisdom.

Let this latter point be distinctly understood; God exists in the universal cosmical system as its soul, but does not exist there *as God*, but only in the quality and capacity of those vitalizing and operative forces and principles of form, which were necessary to the creation, and are now necessary to the subsistence, internal motions, and constant improvement of the general creation, *as such*; in Solar Systems, God exists in the *degree* of those vital and motive forces which are necessary to them, *as such*; in planets God exists, also, in his seven-fold harmonies, but only in a degree necessary to constitute the vitality, and to originate the internal motions and other functional operations, of planets, *as such*; in the Mineral Kingdom God exists as mineral and chemical Life; in the Vegetable Kingdom, as the principle of vegetable Life; in the Animal Kingdom, as the principle of animal, instinctive, and semi-intellectual Life, but not yet as God; in the Human World he exists as the principle of human Life; but only in a perfectly integral, pure, innocent, and harmoniously constituted Man, does He exist in his focalized and quantitatively diminished, but qualitatively perfected Selfhood, *as God*. But in a discreet degree above the whole universe of outer creations, He exists in his August, Infinite, and Ineffable Selfhood, as the Alpha and Omega, the First and the Last, the Beginning and End of all things!

Though these investigations have been pursued, and these

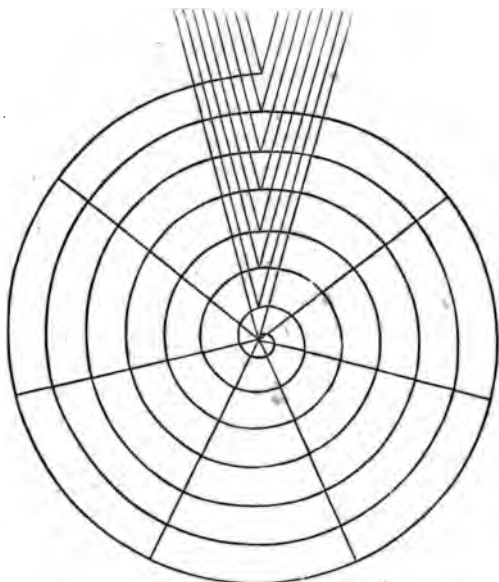
conclusions have been drawn, independently of the revelations of the Scriptures, I can not abstain from marking their perfect parallelism with the language of Paul in the following passages: "One God, who is ABOVE all, and THROUGH all, and IN YOU all."—*Eph.* iv. 6. "And he is BEFORE all things, and by him all things CONSIST."—*Col.* i. 17. "For of him, and THROUGH him, and to him are ALL THINGS; to whom be glory for ever."—*Rom.* xi. 36. Representing the Divine vitalizing principle flowing into, and pervading man, as taking the character of man, the same as when flowing into, and vitalizing animals, vegetables, minerals, worlds, it always takes the specific character of its receptacle—David, addressing the Deity, says, "With the merciful thou wilt show thyself merciful, and with the upright man thou wilt show thyself upright: with the pure thou wilt show thyself pure, and with the froward thou wilt show thyself froward."—*Ps.* xviii. 25, 26. This can not mean that God, in his true personal character, is any other than merciful, upright, and pure, but that his vitalizing and energizing inflowings into man (without which man would be dead, body and soul) can excite the qualities of mercy, uprightness, purity, etc., only as these comport with the character of the receptacle. It is said, moreover, that God dwells "with him who is of an humble and contrite spirit;" that is, dwells, not as a mere generator of material force and action, as he dwells in the lower creations, but dwells *as* God in his interior soul, as in a temple; while the "fullness of the Godhead" dwelt "bodily" only in that ever-to-be-admired personage, who was absolutely *without* sin, who expressly declared that he was in *unity* with the Father—that he was *in* the Father, and the Father in him, and in whose celestial purity, disinterested and unbounded love, and life-long labors and sacrifices for the good of humanity, we

have the only full and true manifestation of the moral attributes of the Deity.

The foregoing will probably serve to the reader as a sufficient illustration of the various *degrees* of the Divine Principle, as now embodied in the different and corresponding Series and Degrees of the creations he has formed. The *method* of the successive origination of these various Series and Degrees of creation, has also been incidentally implied in what has been said; but as this is a point which bears upon important speculations which are rife in these days, some further illustration upon the subject may be useful.

The point to be illustrated and insisted upon is, that creation did not develop itself, either according to inherent forces of its own, nor are its development and its present internal operations, owing simply to the momenta generated by the *first impulses* impressed upon matter by the Creator, while the Creator himself retired for eternity, as one would retire from a clock that was once wound up and set a-going. In case of such retirement of the Deity, after the first impulse had been given to materials, those materials would have moved *only in the direction of the impulse*, and *only until the momentum generated became exhausted*, and creation could not possibly have passed one Elemental Degree beyond a *first* development. Hence, each superior degree of creation must necessarily have been accomplished by the aid of forces *outside of, superior to, and altogether independent of, itself*, which gave the physical elements, involved in the previous development, an upward attraction, and a tendency to aggregate in the form of the next superior series of archetypes conceived in the Divine Mind. And this is true in respect to the development of creation, as one Grand Series, and also in respect to the development of each of its corresponding sub-series.

This whole subject, with other points in our general philosophy, may be illustrated by the accompanying diagram.



Let the seven-fold triangular figure (one angle being *within* another) which descends from the upper part of the diagram, and whose *most exterior* angle comes to a point at the center of the diagram, represent a seven-fold Ray or Glory emanating from the Divine Being. This we will suppose to represent the *Complete Degree* of the Divine Soul, and Spirit, and Person, which was to generate, and to be in some sense embodied in universal creation with Man at its head. Resolved into three Discreet Degrees, we will suppose that this Ray or Glory consisted of Divine Spiritual Heat, which is Love, of Divine Spiritual Light, which is Wisdom, and of Divine Po-

tentializing Essence, which is the "complex, continent, and basis" of the preceding, and hence the medium of volitional operation. We will suppose, then (what *can not* be essentially erroneous), that from the empyrean heights of infinite perfection, where God, before creation began, had from eternity dwelt in inconceivable greatness and perfection, this seven-fold and three-fold Ray emanating from his own Person, descended by volition, and at its lowest extremity, resolved its most exterior essences (represented by the *outer triangle*) into *atomic particles*, which, in forms and constitutions, corresponded to archetypes previously existing in the Divine consciousness, and which were designed to be wrought into the structure of this universe and all it contains. Let the central point in the diagram, then, represent the *atomic* or *lowest* stage of creation, this being the physical Germ from which the great Tree of universal Being was to grow. From this central point, it will be observed, proceeds a *spiral line*, which, while constantly receding from the center, winds around through six radii, and completes the circuit of the diagram on the center of the descending Ray, on which it commenced. This spiral line, in passing around, represents the inception, progress, and completion, of the first Circle, Series, or Complete Degree of Forms. From the center of the descending Ray, and the apex of a second and more interior triangle, the same spiral line thence continues, and, completing another circuit while perpetually receding from the center, represents the course of the next higher and corresponding Circle of creations. And so, commencing every time at the point representing the completion of the previous Circle (this, at the same time, being the focus of a more interior Degree of the Divine generative Principle), it continues its corresponding circuits around the diagram, all the while expanding from the center, and thus representing the

course of higher and still higher creations, until the last is attained, which is Man.

Now the descending Divine creative Ray forms the seventh radius of the circle, which represents the beginning and ending of each Series or complete Degree of creations. But the end of each is represented as *higher* than its beginning, and as in conjunction with, and subject to the operative inflowings of, the next higher Degree of the Divine generative Principle, which is represented by the apex of the next more interior triangle. Each Circle of developments traced *directly*, or from beginning to end, may be called a "line of *natural ascent*;" each circle traced *inversely*, or from end to beginning, may be called a "line of *spiritual descent*," representing the descent or operative inflowings of the Divine vitalizing and formative Energy, by which material elements involved in inferior forms are refined, energized, and brought by an *upward attraction* into next superior, and thence still superior, and finally into *highest* forms, according to the pre-existent archetypes of said forms, or their Divine spiritual patterns. Thus is the great Tree of universal creation brought through all its successive stages of development unto perfection, by constantly descending influences from the Divine *Spiritual* Sun—in the same way as the vegetable tree is made to grow from germ to ultimate, by the constantly descending influences of the *natural* Sun, which, however, is interiorly vitalized by the Spiritual. But we think it ought to be entirely obvious to every intelligent mind, that *without* these descending and vitalizing influences, *neither Tree could proceed a single step* in its ascending development; and, moreover, if at any time during the course of their development, this *superior* and *independent* influence should be withholden, the development would necessarily and immediately cease, and stagnation and decay would ensue.

If the tree can not grow without the sun, it may be considered equally certain that nature as a *whole*, and hence, also, as to its component parts, from greatest to most minute, has no power of development or motion in and of itself. Hence all power, as well as its directive influence, must be from *above* nature, and hence from God; and hence all stellar systems, solar systems, worlds, minerals, vegetables, animals, and even animalcules, were created and are governed, *not only by the remote and indirect, but by the immediate and direct, agency of God!*

These are among the considerations which we think completely overthrow the pantheistic speculations with which much of the philosophy of the day is more or less impregnated.

The diagram, also, by presenting a succession of continually expanding circles, all having one center, and being constituted after one principle, presents a clear and concise illustration of the doctrines of Series, Degrees, and Correspondences, and will serve thus to fix permanently in the mind a true idea of the complexly-unitary constitution, and harmoniously interblending movements of the universe, as expressive of the Love, Wisdom, and infinite internal harmonies of its DIVINE AUTHOR.

CHAPTER XXV.

PROVIDENCE.

THOUGH it is shown in the foregoing pages, that creation must have been developed, and must now be governed in its operations, according to directive Wisdom existing in the forms of *fixed laws*, there is nothing in the theory presented which contradicts, but every thing which confirms, those deep intuitions of every well-regulated mind, respecting the constant *Providence* of God as concerned in the unfolding and government of his creation. If, as we have seen, law of itself has no creative force, but is simply a mode of action prescribed and predetermined by the archetypes and intentions conceived in the Divine Mind; and if to the realization of each succeeding stage of creation, however great or minute, an *additional* and voluntative influx of Divine formative Energy, was absolutely necessary; and, moreover, if the same constant influx is necessary to sustain the life and motions of the system after it is in being—then it follows that every event, from the birth of a world to the falling of a sparrow, or the rustling of a leaf in the summer breeze, is, in some sense, a *Providence*—that is, it was *provided* for in the pre-determined course of Divine intelligent volition and causation. But to prevent involving creation in inextricable confusion, and to establish and preserve an orderly relationship and affectionate interblending of all forms, and a just and harmonious reciprocation in all their offices and movements, God orders even his *providences* accord-

ing to laws, or, it may almost be said, he has made them *synonymous with laws*.

It may safely be believed that the present order and plan of creation is the best that could have been devised by the Divine Mind ; for otherwise, the present plan would not have been adopted. But if it is the best, then it requires no fundamental change, and not even any modifications, except such as may comport with a constant *general progression* on the basis of the original plan. But while all progression in each department is dependent upon an *influx* or inhalation (hence *free bestowment* by the Divine Being), of *additional degrees* of that Divine vitalizing influence which is specifically suitable to itself, and while all progression is in this sense *providential*, God can not, either in causing a progressional or any other change, and without deranging the established, and hence *best possible order of things*, act providentially and *directly* upon any department of creation, except *through the medium of that particular kind of force or vitality of which the thing acted upon is a suitable receptacle*.

Thus, considering the universe in its most general aspect as one grand Whole, God can not act *directly* upon it, or modify its existing activities and tendencies, except through the medium of those forces and laws of Expansion, Contraction, Circulation, Aggregation, etc., in the *degree* in which they apply to the universe as a whole. He can not act *directly* upon solar systems and worlds, except through the medium of the same laws and forces in their higher degrees of unfolding as applicable to solar systems and worlds ; God can not act *directly* upon Mineral creations, except through the forces and laws of *chemical affinities* ; He can not act *directly* upon Vegetable Kingdoms, except through the forces and laws of vegetable life ; He can not act *directly* on the Animal Kingdom, or

any of its forms, except through the forces and laws of animal, sensational, and semi-intellectual life; He can act directly on selfish and sinful human nature, only by those isolated and disjointed motive forces which are adapted to reach and affect the disjointed mental and moral constitutions of selfish and sinful human beings; while God can act *directly* and *fully* as God, in all his affectional, intellectual, and moral nature, only upon a perfectly pure and sinless intelligence—a being fitted for the harmonious influx of all the affectional, intellectual, and voluntative principles of the Divine Soul—a being, hence, who stands in the perfect image of God, and who, in principle, is *one* with Him. Hence, when such a being acts (and there never was but *one* such a being), it may be said that God acts *with* him, *in* him, and *through* him, and that his every act is in the fullest and most Divine sense, a *providence*.

But as the infinite Divine, personal, and volitional Intelligence is above all things, and over all things, and is the inexhaustible Source of all streams of vitality and motive force which flow into the various departments of His creation, it may be rationally conceived, that by withholding his inflowings into the universal system as a whole, he could cause universal stagnation and dissolution to ensue; or that by increasing those inflowings, he could stimulate all firmamental developments and solar and planetary motions, to unwonted activity; or that by diminishing his influence in one portion of space, and increasing it in another, He could cause the dissolution of some worlds, and the absorption of their materials by others; or that by modifying his influences upon the electric, aerial, and subterranean forces of a particular planet (such as our own), he can cause floods to deluge the earth, or subterranean fires to overwhelm cities, and destroy such human beings as must otherwise stand as obstructions to true progress; or that

in a similar way, he might cause a rarefaction of the atmosphere in one locality, and a condensation in another, and thus cause a current of wind sufficiently violent to cleave the waters of a gulf, and afford a dry passage for a particular people through whom he designed to affect great purposes.

It will doubtless still be argued that such occurrences, if they ever do take place, are results simply of the forces and laws of nature. In a qualified sense, this is granted, as we have shown before that *all* action, whether physical or spiritual, is according to some laws; but we insist that it is an exceedingly superficial view of the laws of nature, which supposes that they are self-generative and self-active, or that they can exist for a moment as separate from that Divine vitalizing and spiritual Principle which, in an earlier stage of this work, we showed was necessarily self-existent and eternal.

But if this self-existent, and all generative, and vitalizing Divine Principle may operate upon mundane forces and developments in the way just described, he may, in a similar way, control, modify, and direct chemical and mineral, or vegetable, or animal, or spiritual forces and developments, by a voluntary graduation of those influences, proceeding from himself, as adapted to either of these departments of his creation. And all such operations would be instances of *direct* providences.

But while it would be impossible for God, consistently with the fundamental, which we have presumed to be the best possible plan of creation, to act *directly* upon any *one* department of being, by forces specifically adapted only to *another* (as, for instance, to act directly upon mind, by that Degree of attractive force known as "gravitation," or to directly control planets by the motive forces of moral and

rational convictions), it is none the less conceivable that each department of existence may be *indirectly* influenced through the medium of some other department, which is made the receptacle of *direct* influence. Thus it may be conceived as possible for God, by special and designed action upon a particular planet, to change the orbit of such planet, and thus *mediately* change the orbits of all the planets with which it may be associated, and thus to change their seasons, and thus their inhabitants, if they have any, and thus even to produce an endless concatenation of *spiritual* changes; or, that by action upon one particular department of the Mineral, Vegetable, or Animal Kingdom, He might change other departments of the same Kingdom, and thus indefinitely change the relations existing between them all.

Similar remarks are especially applicable to the Divine government of the *Human* world. Notwithstanding every human being, and the whole race, as one grand Man, was designed to reflect the image of the Creator, human nature, in its present state, is undeniably more or less depraved, selfish, and inharmonious, and hence is not receptive of the Divine influence, in its pure and harmonious state. The Divine spiritual influence, *directly* and *immediately* infused into the human world, therefore, and without the mediumship of a *perfect* human personage to harmoniously reflect, truly define, and correctly apply, its principles, would necessarily take a form of manifestation more or less characterized by the imperfections of degenerate humanity as its *receptacle*—in the same way as the Divine operative influence, flowing into animal or still lower creations, takes a form of manifestation peculiar to those creations. On this principle, and this principle alone, it is conceived, we may account for the imperfection of the *impressions* which the Divine inspiration gave

to Moses, and David, and the prophets, and the imperfections of the code of ethics, principles of government, and policy in respect to other nations, which grew out of these impressions; for all these were evidently imperfect when judged by a *Christian* standard. Still, by means of such inflowings, as the psychical and mental constitutions of these mediums rendered possible, God, without immediately obliterating existing evils, pressed these evils into the service of ultimate good: and by arraying one nation against another, subjecting some to utter extermination, humbling others, by long disciplinary chastisements, etc., so directed the general course of human events as provide for the influx of more and more light, and for the final coming of him who was emphatically "*the Light of the world.*" And now that that Light has come, a similar course of indirect Divine providences is continued with reference to nations and individuals, evidently with the view to the ultimate bringing of all under the full influence of its life-giving beams, and to the establishment of that Divine Kingdom in the world which shall "break to pieces and consume all other kingdoms, and stand for ever."

But if in this disjointed and degenerate state of the human faculties, God can discharge the highest functions of his Divine government only by bringing the appropriate forces of one human faculty, one person, one society, or one nation, to bear upon another, it is equally true that in the *perfect* man, God rules *directly, personally* and absolutely as God, in all his harmoniously consociated affectional, moral, and intellectual attributes—in the same way as he rules as mechanical, chemical, or vegetative Force, in different departments of nature without. Nay, in such a being, as the ultimate and harmonious embodiment of *all* the principles of his Love and Wisdom,

God absolutely *dwells*, in his integral and *personal* capacity, as in a temple; and therefore such a being is God in his focalized capacity as adapted to a direct conjunction with humanity. All that authentic history informs us of the character, actions, and teachings of Jesus goes to justify the belief that he was such a divinely human and humanly divine personage.

It should be observed, that a perfectly pure and sinless intelligence, such as is here conceived, must, as viewed in a *human* aspect, stand at the very *apex* of visible creation, or at that point in a grand seven-fold circle of existence at which *endings* merge into *beginnings*. Hence, the Divine Soul, focalizing in all its harmoniously combined principles, in such a being, would maintain the same relations to inferior physical constitutions, and to all outer physical substances which lie within his sphere, as the Divine Being in his whole infinitude, sustains to the physical universe as a whole. Hence the Divinity, in this *focalized* capacity, would maintain toward all things within his sphere, the relations of a *New Beginning Principle*; and if God in his *infinitude*, as the Beginning Principle of the universe as a *whole*, could, from his free volition, make and unmake laws to govern the present system of things, then God, in the condescended form of his personal Being as manifested through a suitable human organism at the end of an old, and the beginning of a new creation, may, in equal consistency with the rules of Divine order, establish new laws, or rather enact immensely *higher degrees* of old ones, as relating to such existences within his sphere as need such interference. There is nothing irrational in the supposition, therefore, that the Divinely human, or humanly Divine Principle (which are one and the same), could, by volition through the outer organism which served as its medium, concentrate its vital energies upon the diseased bodies of man, and even

the inorganic elements of the outer world, and produce such effects as are commonly designated by the word "miraculous," and that, too, simply according to that *higher degree* of laws specifically adapted to such operations, and unfolded for such specific purposes. Such would be instances of the highest manifestations of *indirect* providences.

But if God dwells and rules, with a perfect and harmonious display of all the principles of his nature *as* God, in a being such as we have supposed, then it follows that the more any man is *like* such a being, the more fully God "works within him to will and to do according to his own pleasure," the more he is under the *direct* operation of the highest order of Divine Providences, the more he is raised, as it were, above the sphere of mere material things and their laws, and the more he becomes a medium through which the Divine Being, in his affectional, intellectual, and volitional nature *as* such, acts upon beings and conditions *below* him, to bring them up to the true standard of healthfulness, harmony, and perfection! And when all human beings shall be fully united to God—shall fully "dwell in him, and he in them," then all human beings, with their outer conditions, and even the whole *physical* world, divinely acted upon through their mediation, will undoubtedly be spiritualized, and elevated one Discreet Degree, and peace and plenty, and that universal harmony and love, which may be considered as uncontaminated and unperverted outflowings from the Divine Fountain of Infinite Harmony and Love, will take the place of the corroding selfishness, the distracting animosities, and the physical, as well as moral, diseases and sufferings which now roll their desolating waves over the earth.

Let it be distinctly understood that the foregoing theory of Divine Providences is presented simply as a rational deduc-

tion of *philosophy*, aside from the teachings of *Scripture*. The few scriptural phrases we have employed in this disquisition, have been employed *incidentally*, solely in consideration of their appositeness, as expressing certain ideas which have lain within the course of our reasonings. Being actuated by the sole desire of developing the teachings of *philosophy*, with reference to these questions of theology, it is not pretended that we have attained to a *full* unfolding of truth upon the subject discussed, or even to so clear a presentation of that measure of truth which has been found, as might have been attained if we had freely availed ourselves of scriptural aids. But while, by the course we have pursued, our conclusions have been left unprejudiced in the view of such of our readers as may be disinclined to admit the authority of the Bible, we beg such readers, in candor, to observe, that so far as the teachings of nature and philosophy have, in these pages, been brought into view, there is *not* that hostility between them and the teachings of the Bible, which unbelievers in the latter have generally supposed to exist. The object of all investigations should be, not to establish the authority of a Book, or of a philosophical creed, but to discover Truth; and if some of the most vitally important of all truths are recorded in the Bible, it must be acknowledged, even by all *candid* infidels, that while these are *no more*, they are *no less* sacred, and while they should be received with *no more*, they should be received with *no less* avidity, than if the same truths were found any where else.

What has been said respecting Providences, will serve to give a general idea of a subject which is far from being exhausted in this discussion. Instances of apparently still more special providences, as affecting the specific con-

ditions of individuals, can be intelligibly illustrated only in view of certain psychological and spiritual laws, which will form the themes of appropriate remark when we proceed to the consideration of the Microcosm, or the universe within.

CONCLUSION OF THE VOLUME.

We have thus endeavored to exhibit a general view of the various Series and Degrees of systematic creation which compose the aggregate of the outer realm of being—both in their separate and united capacities, together with their relations to each other and to their common Divine Cause and Governor. We close this first part of our treatise with the following remarks :

1. If our Philosophy, as to its distinctive features, contains no truth, it can at least do no essential evil, as it must be that a system of unmitigated error, of so bold and conspicuous a kind, and put forth in this unguarded manner, would exhibit so many vulnerable points as to meet with its death wound the instant it is exposed to the shafts of criticism. If it should be entirely overthrown, however, there would still necessarily remain some possible mode of systematizing and harmonizing Nature and Truth in one general philosophic view, if it so be that Nature and Truth are *intrinsically* systematic and harmonious; and the discovery of this mode is worthy of the highest efforts of philosophic minds. I would respectfully submit, however, that promise of a discovery of this kind, can only be given by *some* such process of serial, gradational, and correspondential reasoning from interiors to exteriors, as has been pursued in the foregoing pages; and that so long as men *confine* themselves to the ordinary processes of reasoning merely from effects to causes, so long their conclusions

will, of necessity, be more or less divergent, and so long they will, at most, be able to attain only the *body* of truth, without its *soul*.

2. If our Philosophy contains some truth and some error, then its truths, bearing as they do upon subjects of the most striking and important character, may, by exciting minds capable of elaborating and extending them, yet form the nucleus of a grand system of true thought, which may be progressively brought to a state as near perfect as may comport with the finiteness of the human mind.

3. If it contains a large preponderance of truth, and but little essential error, then considerable progress has already been made in developing the means of reconciling the jargon of conflicting thought upon all subjects natural and spiritual, and in demolishing the partition walls between the Jew of Theology on the one hand, and the Gentile of Philosophy on the other, and making of the twain one new man, thus making peace.

We are next, therefore, in the light of facts, truths, principles, laws, correspondences, etc., developed in the preceding pages, to proceed to consider a general theme of perhaps still more interest, viz., the *Microcosm*, or corresponding universe *within*. In the course of our investigations upon this subject, we shall probably speak of man physically, psychologically, individually, and socially, with a view of exhibiting his relations to all other things, his susceptibility to their influence, and the conditions of his true progress and happiness.

Should not unforeseen influences prevent, this second Treatise, or rather second part of the present one, will be ready for publication in the course of a few months.

END OF THE "MACROCOSM."



A New List of Good Books

PUBLISHED BY

FOWLERS AND WELLS,

NO. 131 NASSAU STREET, NEW YORK.

- American Phrenological Journal and Miscellany.** Devoted to Phrenology, Physiology, and Self-Improvement. A year, \$1 00
- Amativeness; or, Evils and Remedies of Excessive and Perverted Sexuality, with Advice to the Married and Single.** 12½
- Accidents and Emergencies.** By Alfred Smee. Illustrated. Every family should have it, 12½
- Botany for all Classes; containing a Floral Dictionary, with numerous Illustrations.** By John B. Newman, M.D., 50
- Bulwer and Forbes on the Water Treatment.** Edited, with Additional Matter, by R. S. Houghton, M.D., 50
- Constitution of Man, considered in Relation to External Objects.** A new, revised, enlarged, and illustrated edition, 50
- Combe's Lectures on Phrenology.** By George Combe. A complete course as delivered in the United States, 1 00
- Combe on Infancy; or, the Physiological and Moral Management of Children.** Illustrated. An important work, 50
- Chemistry, Applied to Physiology, Agriculture, and Commerce.** By Prof. Liebig. With additions by Dr. Gardiner, 30
- Curiosities of Common Water.** With Additions by Joel Shew, M.D. From the fifth London edition of 1723, 25
- Cholera: Its Causes, Prevention and Cure; and all other Bowel Complaints, treated by Water,** 25
- Combe's Physiology, Applied to the Improvement of Mental and Physical Education.** New edition, with Notes, 50
- Chart for Recording various Developments.** Designed for Phrenologists. With numerous engravings, 64
- Constitution of Man. School Edition.** By George Combe. Arranged with Questions, for a Class-Book, 25
- Consumption, its Prevention and Cure, by the Water Treatment, with directions.** Illustrated, 50
- Chronic Diseases, Especially the Nervous Diseases of Women.** Designed for married people particularly, 25
- Defence of Phrenology.** By Dr. Andrew Boardman. A good work for skeptics and unbelievers, 25

Education Complete. Embracing Physiology, Animal and Mental, Self-Culture, and Memory, in one large volume, . . .	2 00
Education, Founded on the Nature of Man. By Dr. Spurzheim. A scientific work, with illustrations, . . .	50
Elements of Animal Magnetism ; or, Process and Practical Application for relieving human suffering, . . .	12½
Errors of Physicians and Others, in the Ap- plication of the Water-Cure. By J. H. Rausse, . . .	25
Experience in Water-Cure, in Acute and other Diseases, with directions to patients, . . .	25
Familiar Lessons on Phrenology and Physi- ology. Muslin, in one volume. Beautifully illustrated, . . .	1 00
Familiar Lessons on Phrenology. Designed for the use of Children and Youth, illustrated, . . .	50
Familiar Lessons on Physiology. Designed for the use of Children and Youth, with engravings, . . .	25
Fascination ; or, the Philosophy of Charming. (Magnetism.) Illustrating the Principles of Life. Illustrated, . . .	40
Food and Diet: Containing an Analysis of every kind of Food and Drink. By Professor Pereira, . . .	50
Familiar Lessons on Astronomy. Designed for Children and Youth in Schools and Families. Beautifully illustrated, . . .	40
Hereditary Descent: Its Laws and Facts ap- plied to Human Improvement. New edition, illustrated, . . .	50
Human Rights, and their Political Guarant- ties : Founded on the Moral and Intellectual Laws of our Being, . . .	50
Home for All ; or, a New, Cheap, Convenient, and Superior Mode of Building, with appropriate Diagrams, . . .	50
Hydropathic Encyclopedia. A Practical Sys- tem of Hydropathy and Hygiene. Illustrated. By R. T. Trall, M.D. . .	2 00
Hydropathy for the People. An excellent work on health. With Notes by Dr. Trall . . .	50
Introduction to the Water-Cure. With an Exposition of the Human Constitution. By T. L. Nichols, M.D., . . .	12½
Love and Parentage: applied to the Improve- ment of Offspring, including important Directions to the Married, . . .	25
Lectures on the Philosophy of Mesmerism and Clairvoyance. With instruction in its process and practical application, . . .	25
Labor : Its History and Prospects. Including the Use and Abuse of Wealth. By Robert Dale Owen, . . .	25
Lectures on Hygiene and Hydropathy. By R. S. Houghton, M.D., . . .	25

Maternity ; or, the Bearing and Nursing of Children, including Female Education. With appropriate Engravings, . . .	50
Marriage : Its History and Philosophy, with a Phrenological Exposition of the Functions for Happy Marriages, . . .	37½
Memory and Intellectual Improvement: Ap- plied to Self-Education and Juvenile Instruction. Twentieth edition, . . .	50
Mesmerism in India. A superior work, by the celebrated Dr. Esdaile. Highly recommended by professional men, . . .	50
Matrimony ; or, Phrenology and Physiology applied to the Selection of congenial Companions for Life, . . .	25
Moral and Intellectual Science. By Combe, Stratton, Cox, Gregory, and others. Illustrated with Portraits, . . .	2 00
Natural Laws of Man, physiologically con- sidered. By Dr. Spurzheim. A work of great merit, . . .	25
Psychology, or the Science of the Soul. With Engravings of the Nervous System. By Joseph Haddock, M.D., . . .	25
Physiology of Digestion. The Principles of Dietetics. Illustrated with Engravings. By Andrew Combe, M.D., . . .	25
Phrenology Proved, Illustrated, and Applied. Embracing a concise Elementary View of Phrenology, with a Chart . . .	1 00
Phrenological Guide. Designed for the Use of Students of their own Characters. With numerous Engravings, . . .	12½
Phrenological Almanac : Illustrated with nu- merous Engravings—containing illustrated descriptions of character, . . .	64
Popular Phrenology, exhibiting the Phreno- logical Developments of more than fifty different Personages, . . .	25
Power of Kindness ; Inculcating the Christian Principles of Love and Benevolence. An excellent work, . . .	25
Physiology, Animal and Mental: Applied to the Preservation and Restoration of Health of Body and Mind, . . .	50
Phrenology and the Scriptures, showing their Harmony. By Rev. John Pierpont, . . .	12½
Principles of the Human Mind. Biology: in- cluding the Voltaic Mechanism of Man, . . .	25
Philosophy of Electrical Psychology. By John Boyce Dods, . . .	50
Philosophy of Spiritual Intercourse: an Ex- planation of Modern Mysteries. By Andrew Jackson Davis, . . .	50
Religion, Natural and Revealed ; or, the Natural Theology and Moral Bearings of Phrenology, . . .	50
Self-Culture and Perfection of Character ; including the Management of Youth. Improved stereotyped edition, . . .	50

Science of Swimming: Giving the History of Swimming, with special Instruction to Learners. Illustrated, . . .	124
Sober and Temperate Life: With Notes and Illustrations by Comaro, who lived 154 years. Read this Book, . . .	25
Synopsis of Phrenology and Physiology: Illustrating the Temperaments. Designed for Phrenologists and others, . . .	124
Temperance and Tight-Lacing: Founded on the Laws of Life as developed by Phrenology and Physiology, . . .	124
Tobacco: Its Effect on the Body and Mind. The best work on the subject. Every body should read it, . . .	25
The Use of Tobacco; Its Physical, Intellectual, and Moral Effects on the Human System, . . .	124
Teeth; Their Structure, Disease, and Management, with the Causes of Early Decay. Full of Engravings, . . .	124
Thoughts on Domestic Life. Its Concord and Discord, with Suggestions to both Sexes. By Nelson Sizer, . . .	124
Tea and Coffee; Their Physical, Intellectual, and Moral Effects on the Human System, . . .	124
The Parent's Guide, and Childbirth made Easy; with Advice to Mothers. By Mrs. Pendleton, . . .	50
The Illustrated Self-Instructor in Phrenology and Physiology; with One Hundred Engravings and a Chart, . . .	25
Vegetable Diet, as Sanctioned by Medical Men, and Experience in all ages; also a System of Vegetable Cookery, . . .	50
Water-Cure Library; Embracing all of Importance on the Subject. In seven large 12mo volumes, . . .	5 00
Water and Vegetable Diet in Scrofula, Cancer, Asthma, and many other Diseases. By Dr. Lamb, . . .	50
Water-Cure Manual; A Popular Work on Hydropathy. With familiar Directions. Every family should have it, . . .	50
Water-Cure Almanac, Containing much important matter for all classes. Published yearly, . . .	64
Woman: Her Education and Influence. With a General Introduction, by Mrs. Kirkland. With thirteen Portraits, . . .	40
Water-Cure Journal and Herald of Reforms. Devoted to Hydropathy and Medical Reform. Circulation 25,000. A year, . . .	1 00
Water-Cure for Women in Pregnancy and Childbirth. Illustrated with numerous cases. A good work, . . .	25
Water-Cure in Every Known Disease. By J. H. Rausse. Translated by C. H. Meeker, from the German, . . .	50
All Works on Phrenology, Physiology, Magnetism, Physiognomy, Phonography, the Water-Cure, or Hydropathy, may be obtained of FOWLERS AND WELLS, 131 Nassau Street, New York	



Friends of the Cause will confer a favor by giving this Prospectus as wide a circulation as possible.

PROSPECTUS.

THE PHRENOLOGICAL JOURNAL is published on the first of every month, and is devoted to Science, Literature, and General Intelligence.

PHRENOLOGY, as its name indicates, will constitute the leading topic of the Journal, and will be fully explained in an attractive manner, and made clear to the comprehension of all. The science will be amply illustrated with spirited engravings of the virtuous and the vicious, the talented and the simple, with rare specimens from the animal kingdom, and its doctrines applied to all the practical interests and pursuits of the human race. As science is the crowning excellence of man, that science which expounds mind, and teaches its laws of action, and the true mode of educating, guiding, and directing its energies, should command the highest place in man's esteem.

PHYSIOLOGY, or the Laws of Life which relate to the development and health of the body, will be clearly defined, extensively illustrated, and not only relieved from all dry technicalities, but made continually interesting to all; our motto being, "A sound mind in a healthy body."

JOHN F. CUNNINGHAM, based upon Phrenology and physiology, will occupy special attention, and be so placed that every parent requires in the discharge of his parental duties.

JOHN MEX about launching forth upon the ac-

The American PHRENOLOGICAL JOURNAL.



FOR

1853.

DEVOTED TO

Science, Literature, General Intelligence.

TERMS, IN ADVANCE:

Single copy, one year,	\$1 00	Ten copies, one year,	\$7 00
Five "	4 00	Twenty "	10 00

Please address all letters, post-paid, to

Folsom and Wells.

VOLUME XVII.

them from vice, and to prepare them for usefulness and success in the various occupations which will be discussed in the light of Phrenology and Physiology, so that every one may know in what pursuit he would be most likely to succeed.

MAGNETISM will be unfolded, and a rational explanation given of its phenomena and uses as a curative agent, and those interesting Psychological facts which seem to open to the world a new field of interest in the empire of mind.

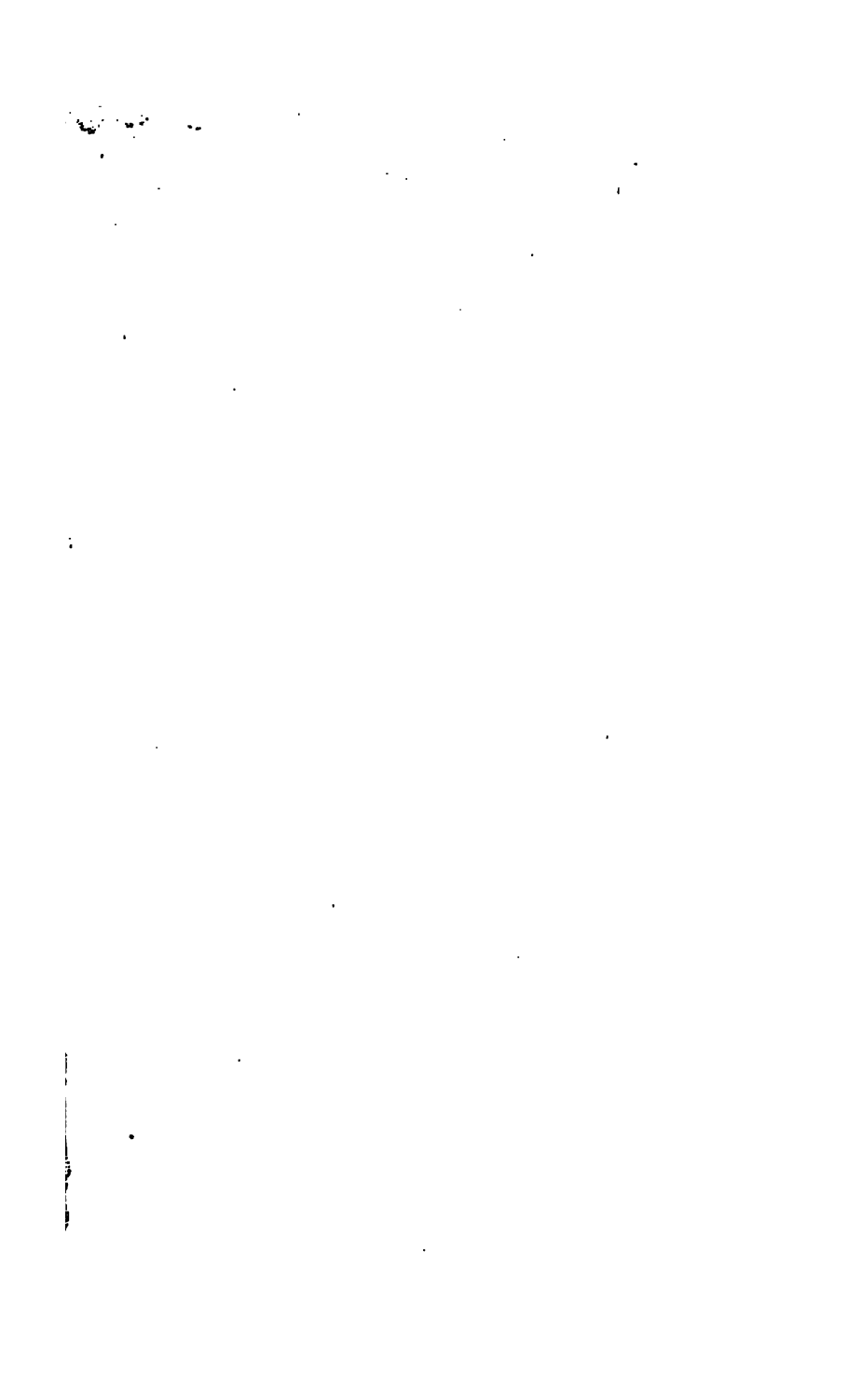
AGRICULTURE, the primitive, most healthful, and independent employment of man, will receive attention, and make the Journal eminently valuable to the farmer, and indeed to all who have a fruit-tree or a garden.

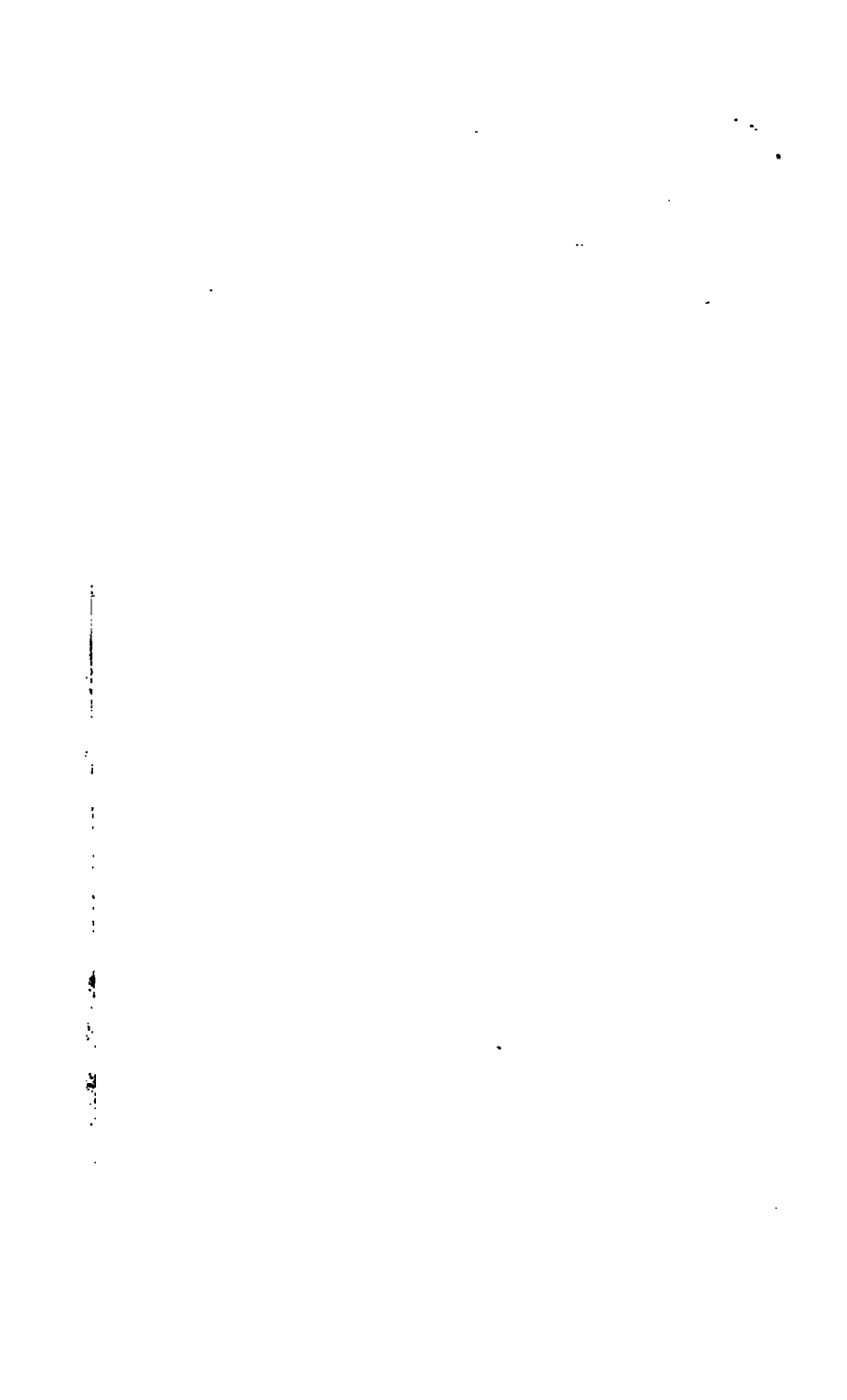
MECHANICAL.—As at least one half the wealth of the world comes through the exercise of the faculty of Constructiveness, the various mechanical arts will be encouraged, new inventions explained and illustrated with engravings.

THE NATURAL SCIENCES, Art, Literature, Mechanism, Agriculture, and General Intelligence, will constitute an essential feature for 1853.

THE MECHANIC, the Farmer, the Professional Man, the Student, the Teacher, and the Mother, will find each number of the Journal an instructive and valuable companion.

TO FRIENDS AND CO-WORKERS.—Every indi-







THE NEW YORK PUBLIC LIBR
REFERENCE DEPARTMENT

Book is under no circumsta
taken from the Buildin

